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**2014-2015-2016-2017-2018-2019**

OF ALL SECONDARY BOARDS

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**2014-2015-2016-2017-2018-2019**

OF ALL SECONDARY BOARDS

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FOR  
**2021**

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# Smart Syllabus Biology (Intermediate Part I)

## CHAPTER 1: INTRODUCTION

Biology and some major fields of specialization, Biological method, Biology and the service of mankind (including the subtopics "Disease Control", "Preventive measures", "Vaccination and Immunisation", and "Drug Treatment/ Gene therapy") (Pg. 1-13)

**Practicals:** No practical

**Questions:**

**Classwork:** Fill in the blanks (i-d), True and False (No), Multiple choice questions (i-iv)

**Homework:** Short questions (i-iv), Extensive questions (i, iv, v)

## CHAPTER 2: BIOLOGICAL MOLECULES

Introduction to biochemistry, Importance of water, Carbohydrates (including the subtopics "monosaccharides", "disaccharides", "polysaccharides"), Lipids (including the subtopics "acylglycerols", "waxes", "phospholipids", "terpenoids"), Proteins: Structure of proteins, Nucleic acids (including the subtopics "DNA" and "RNA") (Pg. 17-33)

**Practicals:**

1. Identification of biochemical from biological materials.
2. Iodine test for starch
3. Benedict's test for reducing sugars
4. Millon's test for Proteins/ Biuret test for proteins
5. Sudan III test for fat and oils and emulsion test

**Questions:**

**Classwork:** Fill in the blanks (i, ii), True and False (i), Multiple choice questions (iv)

**Homework:** Short questions (i, iv and v), Extensive questions (i, iv)

## CHAPTER 3: ENZYMES

Introduction, Characteristics of enzymes, Mechanism of enzyme action (catalysis), Inhibitors, Irreversible inhibitors, Reversible inhibitors (competitive & non-competitive inhibitors) (Pg. 37-43)

**Practicals:** Study of starch break down in germinating grain seeds.

**Questions:**

**Classwork:** Fill in the blanks (i-v), True and False (i-v), Multiple choice questions (No)

**Homework:** Short questions (i, iii-v), Extensive questions (i, 3, 4)

## CHAPTER 4: THE CELL

Structure of a prokaryotic cell: Plasma membrane, Cell wall, Cytoplasm, Endoplasmic reticulum, Ribosomes, Golgi apparatus, Lysosomes, Vacuoles, Cytoskeleton, Centrioles, Mitochondria, Plastids (Chloroplasts, Chromoplasts, Leucoplasts), Nucleus (comprising Prokaryotic and eukaryotic cell) (Pg. 48-64)

**Practicals:** Study of animal cells (Frog's epithelial cells, frog's buccal cavity cells) & plant cells (mesophyll cells, leaf epidermis cells, onion epidermis cells) by staining with safranin, acid fastness, methyl green, eosin

**Questions:**

**Classwork:** Fill in the blanks (i-v), True and False (i-v), Multiple choice questions (i-v)

**Homework:** Short questions (i-v), Extensive questions (i, v)

### CHAPTER 5: VARIETY OF LIFE

Introduction, Monoculture, Two to five kingdom classification systems, Viruses (excluding the introductory paragraph), Characteristics, Structure, Life cycle of bacteriophages, Some viral diseases: small pox, herpes, influenza, mumps and measles, polio, AIDS, Hepatitis (Pg. 87-90)

**Practicals:** No practical

**Questions:**

**Classwork:** Fill in the blanks (3-4), Multiple choice questions (3-4)

**Homework:** No Short question, No extensive question

### CHAPTER 6: KINGDOM PROKARYOTAE (MONERA)

Structure of bacteria, Size, Shape of bacteria, Bacterial cell structure (complete upto page 86 to 89), Nutrition of bacteria, Respiration in bacteria, Growth and Reproduction, Control of bacteria (Physical methods, Chemical methods), Use and abuse of antibiotics, Characteristics of Cyanobacteria (Pg. 91-94)

**Practicals:**

1. Laboratory safety techniques and use of microscope and measurement of microscopic objects by micrometry.
2. Investigation of bacterial content of fresh and stale milk.
3. Study of Nodules from fresh material and prepared slide.

**Questions:**

**Classwork:** Fill in the blanks (3-4), Multiple choice questions (3-4)

**Homework:** Short questions (3, 4, 5-6), Extended questions (3-4, 5)

### CHAPTER 7: THE KINGDOM PROTISTA (OR PROTOCTISTA)

Introduction, Major groups of Protista, Protozoa: Amoeba-like protists, Amoebae, Zooflagellates, Ciliates, Algae: Plant-like protists, Euglenoids, Brown algae, Red algae, Green algae, Importance of algae, Fungus-like protists, Slime molds, Water molds (Pg. 99-111)

**Practicals:** Identification of Chlorella, Paramecium, Amoeba, Entamoeba, Plasmodium (malaria parasite), Euglena, Volvox, Ulva and Ulva from fresh materials or prepared slides.

**Questions:**

**Classwork:** Fill in the blanks (1, 3, 4-5)

**Homework:** Short questions (3, 4, 5), Extensive questions (3-4)

### CHAPTER 8: FUNGI (The Kingdom of Recyclers)

Introduction, The body of fungus, Nutrition in fungi, Reproduction: Asexual reproduction, Sexual reproduction, Classification of fungi, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota, Importance of fungi, Ecological importance, Commercial importance, Economic gains due to fungi, Economic losses due to fungi (Pg. 113-120)

**Practicals:** Study of yeast, Oatmeal tincture and Penicillium from fresh materials and slides.

**Questions:**

**Classwork:** Multiple choice questions (3-4)

**Homework:** Short Questions (3-4), Extensive questions (3-4)

## CHAPTER 9: KINGDOM PLANTAE

Classification of Plantae, Division Bryophyta, Adaptation to land habitat, Division Tracheophyta, Evolution of leaf, Evolution of seed habit, Class Gymnosperms (excluding the subtopic "Pines - life cycle"), Class Angiosperms, Life cycle of an angiospermic plant, Seed formation, double fertilization, Classification of angiosperms (excluding the topic and subtopic of "Angiospermic families") (Pg. 133-153)

### Practicals:

1. Examination of Marchantia and Funaria (external morphology) from fresh material and of six organs from prepared slides
2. Study of Pinus male and female cones from fresh or preserved materials.

### Questions:

Classwork: Fill in the blanks (i-ix), Multiple Choice Questions (j-iv)  
Homework: Short Questions (v, vi, vii, viii), Extensive questions (ix-xi)

## CHAPTER 10: KINGDOM ANIMALIA

Introduction, Grade Radialia, Grade Bilateria, Diploblastic and triploblastic organisation, Acoelomates, pseudocoelomates, coelomates, Grades protostomia & deuterostomia, Phylum Porifera, Phylum Coelenterata (excluding the subtopic "Polysiphonia"), Phylum Platyhelminthes (excluding the subtopics "infestation" and "diseases"), Adaptation for parasitic mode of life, Aschelminths (Phylum Nematoda), Phylum Annelida (excluding the subtopics of classes "Polychaeta", "Oligochaeta", and "Hirudinea"), Phylum Arthropoda (excluding the subtopics of classes "Crustacea", "Insecta", "Arachnida", and "Myriapoda"), Metamorphosis, Economic importance of arthropods, Phylum Mollusca (excluding the subtopics of classes "Gastropoda", "Bivalvia" and "Cephalopoda"), Economic importance of Mollusca, Phylum Echinodermata / Affinities, Phylum Chordata, Sub-phylum Vertebrata, Class Chondrichthyes, Class Osteichthyes (excluding the subtopic "adaptations for aquatic life, Class Amphibia, Class Reptilia, Class Aves, Characters of Birds, Class Mammalia, Sub-class Prototheria, Sub-class Metatheria, Sub-class Eutheria (Pg. 167-200)

Practicals: Dissection of respiratory system of frog.

### Questions:

Classwork: Fill in the blanks (i-x), Multiple choice questions (j, ii, iv, v, vi, viii)  
Homework: Extensive questions (i, ii, vii, viii)

## CHAPTER 11: BIOENERGETICS

Introduction, Photosynthesis, Photosynthetic reactions and products, Water and photosynthesis, Photosynthetic pigments (Chlorophyll, Carotenoids), Reactions of photosynthesis, Light dependent reactions, Non-cyclic phosphorylation, Cyclic phosphorylation, Chemiosmosis, Light independent (or dark) reactions, Respiration, Anaerobic and aerobic respiration, Anaerobic Respiration (alcoholic fermentation, lactic acid fermentation), Cellular Respiration, Glycolysis, Pyruvic acid oxidation, Krebs cycle, Respiratory chain (Pg. 206-218)

Practicals: Extraction and chromatography of leaf chloroplast pigments.

### Questions:

Classwork: Fill in the blanks (i-v), Multiple choice questions (vi-ix)  
Homework: Extensive questions (i-iii, vii-ix, xii, xiii)

**CHAPTER 12: NUTRITION**

Methods of plant nutrition (carnivorous nutrition, parasitic nutrition, symbiotic nutrition, nutrition in non-green plants), Digestion and absorption, Digestion in Man, Digestion in oral cavity, Digestion in stomach, Digestion in small intestine, Absorption of Food, Large intestine, Some common disorders related to nutrition (Dyspepsia, Food poisoning, Obesity, Ulcer) (Pg. 235-254)

**Practicals:** Study of T.S. of liver, stomach, small intestine and large intestine of man prepared slides.

**Questions:**

**Classwork:** Fill in the blanks (i-viii), True and false (i-iii), Multiple choice questions (i-iii, v-vii, ix)

**Homework:** Short questions (i, iii, iv), Extensive questions (i-iv, ix-xii, xiv-xv)

**CHAPTER 13: GASEOUS EXCHANGE**

Advantages and disadvantages of gas exchange in air and water, Gaseous exchange in plants, Properties of respiratory surfaces, Respiration in man, Air passage system, Inspiration, Expiration, Transport of respiratory gases, Transport of oxygen, Transport of carbon dioxide, Carbon dioxide concentration in arterial and venous blood, Respiratory disorders (COPD, Tuberculosis, Asthma), Role of respiratory pigments, Lung capacities (Pg. 279-275)

**Practical:** No practical

**Questions:**

**Classwork:** Fill in the blanks (i-v), True and false (i-ii, v), Multiple choice questions (i, iii-v)

**Homework:** Short questions (i-v), Extensive questions (i, iii-v)

**CHAPTER 14: TRANSPORT**

Transport in plants - Uptake and transport of minerals and water, Mineral absorption by roots, Processes involved in absorption by roots, Uptake of water by roots, Apoplast pathway, Symplast pathway, Vacuolar pathway, Ascent of sap, Cohesion tension theory, Mechanism of transpiration pull in cohesion and tension theory, Root pressure, Imbibition, Girdling, Opening and closing of stomata, Mechanism of phloem translocation, Transport, Diffusion, Pressure flow theory, Circulatory system, Characteristics of circulatory system, Open and closed circulatory system, Comparison of open and closed circulatory system, Transport in man, The circulatory fluid - the blood, Functions of blood, Disorders (blood cancer, Thalassemia), Pumping organ - The heart, Structure and action, The cardiac cycle, Mechanisms of heart excitation and Conduction, Electrocardiogram, Artificial pace-maker, Blue babies, Blood vessels: Arteries, Capillaries, Veins, Blood pressure and rate blood flow, Hypertension, Thrombus formation and hypertension, Heart attack, Stroke, Hemorrhage, Lymphatic system, Immunity, Types of immunity (Pg. 276-327)

**Practicals:**

1. Demonstration of osmosis in living plant cells, (manifested by plasmolysis and deplasmolysis of onion cells or spirogyra)
2. Study from prepared slides of internal structure of monocot and dicot root, stem and leaf.

- 1. Investigation of normal distribution (using clear milk, varnish or epidermal peel)
- 2. Study of prepared, stained slide of human blood including identification of prokaryotes and leucocytes and preparation of slide of blood smear of frog.
- 3. Study of smears of artery, vein, capillary from frog T.S. (Prepared slides)
- 4. Study of effect of sympathetic and adrenergic on the heartbeat of frog.
- 5. Exposure of blood circulatory system of frog (heart and main blood vessels).
- 6. Measurement of blood pressure during rest and after exercise with B.P. apparatus.

**Questions:** Fill in the blanks (5-6), Multiple choice questions (1-3), True and false (1-1)

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## CHAPTER 01

## Introduction

## MULTIPLE CHOICE QUESTIONS (MCQ's)

- The study of distribution of animals in nature is called: (NEW CL 2004; COM CL 2010)  
☒ (A) Zoogeography (B) Biogeography (C) Limnography (D) Biogeography
- The study of internal structure is: (NEW CL 2004; COM CL 2010)  
☐ (A) Morphology ☒ (B) Anatomy (C) Histology (D) Physiology
- The number of species identified so far is: (NEW CL 2004)  
☐ (A) 10 million ☐ (B) 5 million ☒ (C) 2.3 million ☐ (D) 1.2 million
- The branch of biology which deals with the study of ancestral history of living organisms is called as: (NEW CL 2004; COM CL 2010)  
☐ (A) Paleontology ☐ (B) Zoogeography ☒ (C) Evolution ☐ (D) Heredity
- Embryology is the study of: (NEW CL 2004)  
☐ (A) Fossils ☐ (B) Tissues ☒ (C) Development ☐ (D) Internal gross structure
- In human body, amount of phosphorus is: (NEW CL 2004)  
☒ (A) 1% ☐ (B) 2% ☐ (C) 10% ☐ (D) 22%
- Mammals became dominant in: (NEW CL 2004; COM CL 2010)  
☐ (A) Mesozoic period ☒ (B) Cretaceous period ☐ (C) Palaeozoic period ☐ (D) Jurassic period
- The study of microorganism includes bacteria, virus, protozoan and microscopic algae and fungi is: (NEW CL 2004)  
☒ (A) Microbiology ☐ (B) Parasitology ☐ (C) Molecular biology ☐ (D) Biotechnology
- The study of parasite is called: (NEW CL 2004)  
☐ (A) Paleontology ☐ (B) Histology ☐ (C) Microbiology ☒ (D) Parasitology
- The number and variety of species in a place is called: (NEW CL 2004; COM CL 2010)  
☐ (A) Population ☒ (B) Community ☐ (C) Biodiversity ☐ (D) Diversity
- The muscles of stomach is of which type? (NEW CL 2004)  
☒ (A) Skeletal ☐ (B) Smooth ☐ (C) Cardiac ☐ (D) All above
- Fungi, algae, protozoans and various prokaryotes are: (NEW CL 2004)  
☐ (A) 17.6% ☐ (B) 19.9% ☒ (C) 9.4% ☐ (D) 9.1%
- The number of the species of insects is: (NEW CL 2004; COM CL 2010)  
☒ (A) 53.1% ☐ (B) 17.6% ☐ (C) 19.9% ☐ (D) 9.4%
- The reasoning from the general to specific is: (NEW CL 2004; COM CL 2010)  
☒ (A) Deductive ☐ (B) Inductive ☐ (C) Scientific ☐ (D) Theoretical
- The most recent era is: (NEW CL 2004; COM CL 2010)  
☐ (A) Proterozoic ☐ (B) Palaeozoic ☒ (C) Cenozoic ☐ (D) Mesozoic
- The branch of biology which deals with the study of social behavior and communal life of human being is: (NEW CL 2004; COM CL 2010)  
☐ (A) Human biology ☐ (B) Molecular biology ☒ (C) Social biology ☐ (D) Environmental biology

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### SHORT ANSWER QUESTIONS -

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Q. What is the difference between a population and a sample?

A. A population is the entire group of individuals being studied, while a sample is a subset of the population.

Q. What is the difference between a parameter and a statistic?

A. A parameter is a numerical value that describes a characteristic of a population, while a statistic is a numerical value that describes a characteristic of a sample.

Q. What is the difference between a qualitative and a quantitative variable?

A. A qualitative variable is a variable that cannot be measured, while a quantitative variable is a variable that can be measured.

Q. What is the difference between a discrete and a continuous variable?

A. A discrete variable is a variable that has a finite number of possible values, while a continuous variable is a variable that has an infinite number of possible values.

Q. What is the difference between a nominal and a ordinal variable?

A. A nominal variable is a variable that has categories that cannot be ordered, while an ordinal variable is a variable that has categories that can be ordered.

Q. What is the difference between a ratio and a interval variable?

A. A ratio variable is a variable that has a true zero point, while an interval variable is a variable that does not have a true zero point.

Q. What is the difference between a mean and a median?

A. The mean is the average of a set of values, while the median is the middle value of a set of values.

Q. What is the difference between a mode and a range?

A. The mode is the most frequent value in a set of values, while the range is the difference between the highest and lowest values in a set of values.

Q. What is the difference between a variance and a standard deviation?

A. The variance is the average of the squared differences between each value and the mean, while the standard deviation is the square root of the variance.

Q. What is the difference between a coefficient of correlation and a coefficient of determination?

A. The coefficient of correlation is a measure of the strength and direction of the relationship between two variables, while the coefficient of determination is a measure of the proportion of the variance in one variable that is explained by the variance in another variable.

Q. What is the difference between a hypothesis and a theory?

A. A hypothesis is a statement that can be tested, while a theory is a statement that has been tested and found to be true.

Q. What is the difference between a population and a sample?

A. A population is the entire group of individuals being studied, while a sample is a subset of the population.

Q. What is the difference between a parameter and a statistic?

A. A parameter is a numerical value that describes a characteristic of a population, while a statistic is a numerical value that describes a characteristic of a sample.

Q. What is the difference between a qualitative and a quantitative variable?

A. A qualitative variable is a variable that cannot be measured, while a quantitative variable is a variable that can be measured.

Q. What is the difference between a discrete and a continuous variable?

A. A discrete variable is a variable that has a finite number of possible values, while a continuous variable is a variable that has an infinite number of possible values.

Q. What are the characteristics of the following?

Ans. The characteristics of the following are as follows:

1. Name at least two plants in which leaf is modified to perform the following functions:

Ans. (i) Storage of food (ii) Photosynthesis

Q. What is the significance of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

Q. What are the characteristics of the following?

Ans. (i) Storage of food (ii) Photosynthesis

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Standard 14

When a researcher is interested in the relationship between two variables, the first step is to determine the direction of the relationship. This can be done by looking at the sign of the correlation coefficient. If the coefficient is positive, it indicates a positive relationship, meaning that as one variable increases, the other variable also tends to increase. If the coefficient is negative, it indicates a negative relationship, meaning that as one variable increases, the other variable tends to decrease.

Next, the researcher should determine the strength of the relationship. This can be done by looking at the magnitude of the correlation coefficient. A coefficient close to 1 (or -1) indicates a strong relationship, while a coefficient close to 0 indicates a weak relationship.

Finally, the researcher should consider the possibility of confounding variables. These are variables that are not being studied but that may influence the relationship between the two variables of interest. To control for confounding variables, the researcher can use techniques such as random assignment, matching, or statistical control.

### ESSAY TYPE QUESTIONS

1. Define the following terms: (a) correlation, (b) causation, (c) confounding variable, (d) random assignment, (e) matching, (f) statistical control.
2. Explain the difference between a positive correlation and a negative correlation. Give an example of each.
3. Describe the relationship between correlation and causation. Why does correlation not imply causation?
4. What are the limitations of the correlation method for studying a psychological problem?
5. Explain the advantages and disadvantages of the experimental method for studying a psychological problem.
6. Describe the role of random assignment in experimental research. Why is it important?
7. Describe the role of matching in experimental research. Why is it important?
8. Describe the role of statistical control in experimental research. Why is it important?





1. The first step in the synthesis of a nucleic acid is the formation of a nucleoside. This involves the reaction of a pentose sugar with a nitrogenous base. The reaction is catalyzed by the enzyme **phosphoribosyl transferase**.
2. The second step in the synthesis of a nucleic acid is the formation of a nucleotide. This involves the reaction of a nucleoside with a phosphate group. The reaction is catalyzed by the enzyme **nucleoside kinase**.
3. The third step in the synthesis of a nucleic acid is the formation of a polynucleotide. This involves the reaction of a nucleotide with another nucleotide. The reaction is catalyzed by the enzyme **polynucleotide kinase**.
4. The fourth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a polynucleotide with another polynucleotide. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
5. The fifth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
6. The sixth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
7. The seventh step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
8. The eighth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
9. The ninth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.
10. The tenth step in the synthesis of a nucleic acid is the formation of a nucleic acid. This involves the reaction of a nucleic acid with another nucleic acid. The reaction is catalyzed by the enzyme **nucleic acid kinase**.

**SHORT ANSWER QUESTIONS**

1. What is the first step in the synthesis of a nucleic acid?
2. What is the second step in the synthesis of a nucleic acid?
3. What is the third step in the synthesis of a nucleic acid?
4. What is the fourth step in the synthesis of a nucleic acid?
5. What is the fifth step in the synthesis of a nucleic acid?
6. What is the sixth step in the synthesis of a nucleic acid?
7. What is the seventh step in the synthesis of a nucleic acid?
8. What is the eighth step in the synthesis of a nucleic acid?
9. What is the ninth step in the synthesis of a nucleic acid?
10. What is the tenth step in the synthesis of a nucleic acid?

1. Define a variable as a symbol that represents a value that can change.

2. Write an equation that represents the relationship between the number of hours worked and the amount of money earned.

3. Write an equation that represents the relationship between the number of items purchased and the total cost.

4. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee.

5. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount.

6. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax.

7. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee.

8. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee.

9. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee.

10. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee.

11. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee.

12. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee.

13. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee, and a processing fee.

14. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee, and a processing fee, and a service fee.

15. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee, and a processing fee, and a service fee, and a membership fee.



16. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee, and a processing fee, and a service fee, and a membership fee, and a subscription fee.

17. Write an equation that represents the relationship between the number of items purchased and the total cost, including a fixed fee and a discount, and a tax, and a shipping fee, and a handling fee, and a packaging fee, and a delivery fee, and a return shipping fee, and a restocking fee, and a processing fee, and a service fee, and a membership fee, and a subscription fee, and a loyalty fee.

[illegible]

*[Faint, illegible handwritten notes or bleed-through from another page.]*

[illegible]

$\mathbb{K}[t]$

[illegible]

1. Show that the following are solutions of the wave equation in the region  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 1$ .

$\mathbb{K}[t] = \mathbb{K}[x_1, \dots, x_n]$

10. 11. 1950

1944

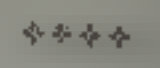
4.  $\frac{1}{2} \log \frac{1}{2}$

[illegible]



Handwritten notes on a lined page, likely from a biology textbook. The text is written in cursive and includes several paragraphs discussing biological concepts. At the top right, there is a header that reads "Biology Intermediate Part". The notes are organized into sections, with some parts starting with "Q. No." and others with "A. No.". The handwriting is somewhat faded and difficult to read in many places.

- SHORT TYPE QUESTIONS**
- Q.1. Write importance of protein in nutrition of life.
  - Q.2. Define water as medium of life. Also give its importance.
  - Q.3. Describe the properties of water.
  - Q.4. Write importance of water for plants.
  - Q.5. Describe structure and functions of mitochondria in plants.
  - Q.6. What functions are performed by proteins in the bodies of living organisms?
  - Q.7. Classify proteins according to their structure.
  - Q.8. Write down the major functions of proteins.
  - Q.9. Describe structure and function of proteins.
  - Q.10. Describe secondary and tertiary structure of proteins.
  - Q.11. Describe the structure of DNA and its function in the body of living organisms.



# CHAPTER 20

## Enzymes

### MULTIPLE CHOICE QUESTIONS (MCQs)

1. The reaction rate of an enzyme is least sensitive to
  - a. pH
  - b. temperature
  - c. substrate concentration
  - d. enzyme concentration

**1B** b
2. The deactivation of an enzyme by a chemical
  - a. is irreversible
  - b. is reversible
  - c. is not reversible
  - d. is not reversible

**2C** c
3. The activation energy of the reaction is reduced by
  - a. the enzyme
  - b. the substrate
  - c. the product
  - d. the reaction

**3A** a
4. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**4A** a
5. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**5A** a
6. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**6A** a
7. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**7A** a
8. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**8A** a
9. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**9A** a
10. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**10A** a
11. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**11A** a
12. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**12A** a
13. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**13A** a
14. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**14A** a
15. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**15A** a
16. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**16A** a
17. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**17A** a
18. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**18A** a
19. The enzyme is an example of a
  - a. protein
  - b. lipid
  - c. carbohydrate
  - d. nucleic acid

**19A** a

1. The first part of the book is devoted to the history of the United States. It is divided into two parts. The first part is devoted to the early years of the country, and the second part is devoted to the more recent years.

2. The second part of the book is devoted to the history of the United States. It is divided into two parts. The first part is devoted to the early years of the country, and the second part is devoted to the more recent years.

3. The third part of the book is devoted to the history of the United States. It is divided into two parts. The first part is devoted to the early years of the country, and the second part is devoted to the more recent years.

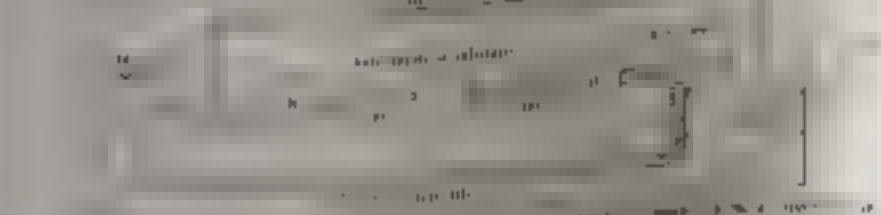
**SHORT ANSWER QUESTIONS**

1. What are the two main parts of the book?
2. What are the two main parts of the book?
3. What are the two main parts of the book?
4. What are the two main parts of the book?
5. What are the two main parts of the book?
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7. What are the two main parts of the book?
8. What are the two main parts of the book?
9. What are the two main parts of the book?
10. What are the two main parts of the book?



Q. How enzymes work to speed up chemical reactions?

Ans. Enzymes are biological catalysts. They are proteins that speed up chemical reactions by lowering the activation energy. They do this by providing an alternative pathway for the reaction.



Q. Write down any four characteristics of enzymes.

Ans. Characteristics of enzymes:

- Enzymes are highly specific.
- Enzymes are not consumed during the reaction.
- Enzymes are sensitive to temperature and pH.
- Enzymes are biological catalysts.

Q. What is enzyme in our body?

Ans. Enzymes are proteins that act as biological catalysts in our body.

Enzymes are found in all living organisms. They are responsible for most of the chemical reactions that take place in the body. For example, enzymes are involved in the digestion of food, the production of energy, and the synthesis of proteins and other molecules.

Q. Define lock and key model of enzyme action.

The lock and key model of enzyme action states that the active site of an enzyme is a specific shape that fits the substrate molecule. The substrate molecule fits into the active site of the enzyme, and the reaction takes place.

Q. Give some examples of enzymes produced in the liver from liver example.

Example: Pepsin is an enzyme produced in the liver. It is involved in the digestion of proteins.

Q. What is lock and key model? Who proposed this model?

Ans. The lock and key model was proposed by Emil Fischer. It states that the active site of an enzyme is a specific shape that fits the substrate molecule.

What is the effect of allosteric inhibition on enzyme activity?

Allosteric inhibition of an enzyme is a type of non-competitive inhibition. It occurs when an inhibitor binds to a site on the enzyme other than the active site, causing a change in the shape of the active site and preventing the substrate from binding.

What are the two main types of allosteric inhibition?

The two main types of allosteric inhibition are non-competitive inhibition and uncompetitive inhibition.

Examples of allosteric inhibition include the inhibition of aspartate aminotransferase by pyridoxal phosphate and the inhibition of aspartate aminotransferase by pyridoxal phosphate.

What is the difference between competitive and non-competitive inhibition?

Competitive inhibition occurs when an inhibitor binds to the active site of an enzyme, preventing the substrate from binding. Non-competitive inhibition occurs when an inhibitor binds to a site on the enzyme other than the active site, causing a change in the shape of the active site and preventing the substrate from binding.

What are competitive and non-competitive inhibitors?

Competitive inhibitors are molecules that bind to the active site of an enzyme, preventing the substrate from binding. Non-competitive inhibitors are molecules that bind to a site on the enzyme other than the active site, causing a change in the shape of the active site and preventing the substrate from binding.

What is the difference between competitive and non-competitive inhibition of enzyme activity?

Competitive inhibition occurs when an inhibitor binds to the active site of an enzyme, preventing the substrate from binding. Non-competitive inhibition occurs when an inhibitor binds to a site on the enzyme other than the active site, causing a change in the shape of the active site and preventing the substrate from binding.

What is the effect of allosteric inhibition on enzyme activity?

Allosteric inhibition of an enzyme is a type of non-competitive inhibition. It occurs when an inhibitor binds to a site on the enzyme other than the active site, causing a change in the shape of the active site and preventing the substrate from binding.

# Handwritten title: 26 Biology nie medische Ps

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# The Cell

## MULTIPLE CHOICE QUESTIONS (MCQ'S)

1. A cell is the smallest unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
2. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
3. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
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  - d. nucleus and vacuole
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  - d. nucleus and vacuole
6. The cell is the basic unit of life. It is composed of
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  - d. nucleus and vacuole
7. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
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  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
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  - b. nucleus and cell membrane
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  - d. nucleus and vacuole
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  - c. nucleus and cell wall
  - d. nucleus and vacuole
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  - c. nucleus and cell wall
  - d. nucleus and vacuole
12. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
13. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
14. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
15. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
16. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
17. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
18. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole
19. The cell is the basic unit of life. It is composed of
  - a. nucleus and cytoplasm
  - b. nucleus and cell membrane
  - c. nucleus and cell wall
  - d. nucleus and vacuole

| Question | Answer                                     | Page | Topic | Section | Sub-section |
|----------|--|------|-------|---------|-------------|
| 1        | the number of species in a community is    | 10   | 10    | 10      | 10          |
| 2        | Organisms are concerned with cell division | 10   | 10    | 10      | 10          |
| 3        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 4        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 5        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 6        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 7        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 8        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 9        | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 10       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 11       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 12       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 13       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 14       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 15       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 16       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 17       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 18       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 19       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 20       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 21       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 22       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 23       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 24       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 25       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 26       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 27       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 28       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 29       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 30       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 31       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 32       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 33       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 34       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 35       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 36       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 37       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 38       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 39       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 40       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 41       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 42       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 43       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 44       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 45       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 46       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 47       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 48       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 49       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |
| 50       | the rate of photosynthesis in plants is    | 10   | 10    | 10      | 10          |

40. The cell cycle is a series of events that lead to the production of two daughter cells. The cell cycle is divided into two main phases: interphase and mitosis. Interphase is the longest phase of the cell cycle, during which the cell grows and prepares for division. Mitosis is the process of cell division, during which the cell's genetic material is divided into two equal parts.
41. The cell cycle is a series of events that lead to the production of two daughter cells. The cell cycle is divided into two main phases: interphase and mitosis. Interphase is the longest phase of the cell cycle, during which the cell grows and prepares for division. Mitosis is the process of cell division, during which the cell's genetic material is divided into two equal parts.
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43. The cell cycle is a series of events that lead to the production of two daughter cells. The cell cycle is divided into two main phases: interphase and mitosis. Interphase is the longest phase of the cell cycle, during which the cell grows and prepares for division. Mitosis is the process of cell division, during which the cell's genetic material is divided into two equal parts.

### SHORT ANSWER QUESTIONS

1. What is the cell cycle? The cell cycle is a series of events that lead to the production of two daughter cells. It is divided into two main phases: interphase and mitosis.
2. What is interphase? Interphase is the longest phase of the cell cycle, during which the cell grows and prepares for division. It is divided into three sub-phases: G1, S, and G2.
3. What is mitosis? Mitosis is the process of cell division, during which the cell's genetic material is divided into two equal parts. It is divided into four sub-phases: prophase, metaphase, anaphase, and telophase.
4. What is cytokinesis? Cytokinesis is the process of cell division, during which the cell's cytoplasm is divided into two equal parts. It is the final phase of the cell cycle.
5. What is the cell cycle clock? The cell cycle clock is a series of events that control the timing of the cell cycle. It is a complex system of proteins and enzymes that regulate the progression of the cell cycle.
6. What is the cell cycle checkpoint? The cell cycle checkpoint is a point in the cell cycle where the cell checks for errors and decides whether to proceed with division. There are three main checkpoints: G1/S, M, and G2/M.
7. What is the cell cycle inhibitor? The cell cycle inhibitor is a protein that prevents the cell from entering the S phase of the cell cycle. It is a key component of the cell cycle clock.
8. What is the cell cycle promoter? The cell cycle promoter is a protein that promotes the cell from entering the S phase of the cell cycle. It is a key component of the cell cycle clock.
9. What is the cell cycle regulator? The cell cycle regulator is a protein that regulates the progression of the cell cycle. It is a key component of the cell cycle clock.
10. What is the cell cycle control system? The cell cycle control system is a complex system of proteins and enzymes that regulate the progression of the cell cycle. It is a key component of the cell cycle clock.



$\frac{1}{2} \rho \frac{d^2 x}{dt^2} = - \frac{1}{2} \rho \frac{d^2 x}{dt^2} = - \frac{1}{2} \rho \frac{d^2 x}{dt^2}$



**Q** Yes. If you're a  
typical person, it's  
just a  
little bit more.

[illegible]

1. 1972-73  
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 46. 2017-18  
 47. 2018-19  
 48. 2019-20  
 49. 2020-21  
 50. 2021-22

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

$$\int_{\mathbb{R}^n} \left( \frac{1}{2} \left( \frac{\partial u}{\partial t} \right)^2 + \frac{1}{2} \left( \frac{\partial u}{\partial x} \right)^2 + \frac{1}{2} \left( \frac{\partial u}{\partial y} \right)^2 + \frac{1}{2} \left( \frac{\partial u}{\partial z} \right)^2 \right) dx dy dz$$

[illegible]

Q. Where are the two ribosomes assembled?  
 Ans. The two ribosomes are assembled in the nucleolus of nucleus and are later exported to the cytoplasm.

Q. How cell wall of plants differ from prokaryotes?  
 Ans. The plant cell wall is made of cellulose, hemicellulose and pectin. It is a secondary wall. The cell wall of prokaryotes is made of peptidoglycan. It is a primary wall. The cell wall of prokaryotes is thicker than the cell wall of plants.

Q. What is the structure of cell wall?  
 Ans. The structure of cell wall is as follows: The cell wall is made of cellulose, hemicellulose and pectin. It is a secondary wall. The cell wall of prokaryotes is made of peptidoglycan. It is a primary wall. The cell wall of prokaryotes is thicker than the cell wall of plants.

Q. What are the important functions of cell wall?  
 Ans. The important functions of cell wall are: 1. It provides structural support to the cell. 2. It prevents the cell from bursting or shrinking. 3. It allows the cell to take up water and nutrients. 4. It allows the cell to release waste products. 5. It allows the cell to communicate with other cells.

Q. What is the difference between plant and animal cells?  
 Ans. The difference between plant and animal cells is as follows: Plant cells have a cell wall, while animal cells do not. Plant cells have a large central vacuole, while animal cells do not. Plant cells have chloroplasts, while animal cells do not.

Q. What are the important organelles of a cell?  
 Ans. The important organelles of a cell are: 1. Nucleus: It contains the genetic material. 2. Mitochondria: It is the site of cellular respiration. 3. Golgi apparatus: It is involved in the transport of materials. 4. Lysosomes: They are involved in the breakdown of waste materials. 5. Endoplasmic reticulum: It is involved in the synthesis of proteins and lipids.

Q. What is the difference between prokaryotic and eukaryotic cells?  
 Ans. The difference between prokaryotic and eukaryotic cells is as follows: Prokaryotic cells do not have a nucleus, while eukaryotic cells do. Prokaryotic cells are smaller than eukaryotic cells. Prokaryotic cells have a cell wall, while eukaryotic cells do not. Prokaryotic cells have a single circular chromosome, while eukaryotic cells have multiple linear chromosomes.

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Q. Give the functions of lysosomes in eukaryotic cell.

Ans. Lysosomes are the organelles in which the digestion of the material takes place. They are known as the 'garbage disposal' of the cell. They contain digestive enzymes which break down the waste materials and foreign particles into simpler substances. The simpler substances are then either recycled or excreted from the cell.

Q. Give the functions of lysosomes in eukaryotic cell.

Ans. Lysosomes are the organelles in which the digestion of the material takes place. They are known as the 'garbage disposal' of the cell. They contain digestive enzymes which break down the waste materials and foreign particles into simpler substances. The simpler substances are then either recycled or excreted from the cell.

Q. How does cytoplasm differ from cytoskeleton?

Ans. The cytoplasm is the fluid matrix in which the organelles are suspended. It is composed of water, salts, and various organic molecules. The cytoskeleton, on the other hand, is a network of protein fibers that provides structural support and is involved in cell movement and division. The cytoskeleton is made up of microtubules, microfilaments, and intermediate filaments.

Q. Give role and composition of cytoskeleton.

Ans. The cytoskeleton is a network of protein fibers that provides structural support and is involved in cell movement and division. The cytoskeleton is made up of microtubules, microfilaments, and intermediate filaments. The role of the cytoskeleton is to maintain the cell's shape, provide a framework for organelles, and facilitate the movement of materials within the cell. The composition of the cytoskeleton includes various proteins, including tubulin, actin, and keratin.

Q. What are intermediate filaments?

Ans. Intermediate filaments are a type of cytoskeletal fiber that provides mechanical strength to the cell. They are composed of various proteins, including keratin, vimentin, and desmin. Intermediate filaments are involved in cell division, cell movement, and the maintenance of cell shape.

Q. What is the function of the nucleus?

A. The nucleus is the control center of the cell. It contains the cell's genetic material (DNA) and is responsible for the cell's growth, development, and reproduction.

Q. What is the function of the mitochondria?

A. The mitochondria are the powerhouses of the cell. They are responsible for producing energy in the form of ATP (Adenosine Triphosphate) through the process of cellular respiration.

Q. What is the function of the Golgi apparatus?

A. The Golgi apparatus is a series of stacked, flattened sacs called cisternae. It is responsible for processing and packaging proteins and lipids for transport to other parts of the cell or for secretion outside the cell.

Q. What is the function of the lysosomes?

A. Lysosomes are organelles that contain digestive enzymes. They are responsible for breaking down and recycling cellular waste, including old organelles and foreign particles that enter the cell.

Q. What are the functions of the endoplasmic reticulum?

A. The endoplasmic reticulum (ER) is a network of membranes that is involved in the synthesis and transport of proteins and lipids. It is divided into two main types: rough ER (studded with ribosomes) and smooth ER (lacking ribosomes).

Q. What is the function of the plasma membrane?

A. The plasma membrane is the outer boundary of the cell. It is a phospholipid bilayer that regulates the movement of substances in and out of the cell, maintaining the cell's internal environment.



14. Define the term **epithelial tissue**.  
 It is a type of tissue that covers the surface of organs and lines internal cavities. It is composed of cells that are closely packed together.
15. State the functions of **epithelial tissue**.  
 It functions to protect the underlying tissues from mechanical damage, infection, and dehydration. It also plays a role in absorption and secretion.
16. What is **connective tissue**?  
 It is a type of tissue that connects different parts of the body. It is composed of cells and a large amount of extracellular matrix.
17. What are the **functions of connective tissue**?  
 It functions to support and connect different parts of the body. It also plays a role in the transport of nutrients and waste.
18. What are the **functions of muscle tissue**?  
 It functions to contract and generate force, which allows for movement. It is composed of specialized cells called muscle fibers.
19. What are the **functions of nervous tissue**?  
 It functions to transmit electrical signals (nerve impulses) throughout the body. It is composed of specialized cells called neurons.
20. Differentiate between **epithelial tissue** and **connective tissue**.  

| Epithelial tissue   | Connective tissue   |
|---|---|
| It is composed of cells that are closely packed together.   | It is composed of cells and a large amount of extracellular matrix.                           |
| It functions to protect the underlying tissues from mechanical damage, infection, and dehydration.        | It functions to support and connect different parts of the body.                              |
| It is found on the surface of organs and lines internal cavities.   | It is found throughout the body, connecting different parts.                                  |
| It is highly organized and has a clear polarity.  | It is less organized and has a more amorphous structure.                                      |
| It is composed of a single layer of cells (simple epithelium) or multiple layers (stratified epithelium). | It is composed of various types of cells, including fibroblasts, macrophages, and adipocytes. |

Q1. What is the function of the nucleus? Ans: 1. It is the control centre of the cell.  
 Q2. What is the function of the mitochondria? Ans: 2. It is the power house of the cell.

Q3. What is the function of the chloroplast? Ans: 3. It is the site of photosynthesis.  
 Q4. What is the function of the vacuole? Ans: 4. It is a storage sac.

Q5. What is the function of the lysosome? Ans: 5. It is a digestive organelle.  
 Q6. What is the function of the Golgi apparatus? Ans: 6. It is a transport system.

Q7. What is the function of the endoplasmic reticulum? Ans: 7. It is a network of membranes.  
 Q8. What is the function of the plasma membrane? Ans: 8. It is the outer boundary of the cell.

Q9. What is the function of the cell wall? Ans: 9. It provides structural support.  
 Q10. What is the function of the centrioles? Ans: 10. They are involved in cell division.

Q11. What is the function of the ribosomes? Ans: 11. They are the site of protein synthesis.  
 Q12. What is the function of the cytoskeleton? Ans: 12. It provides a framework for the cell.

Q13. What is the function of the flagella? Ans: 13. They are used for locomotion.  
 Q14. What is the function of the cilia? Ans: 14. They are used for movement of fluids.

Q15. What is the function of the microvilli? Ans: 15. They increase the surface area for absorption.  
 Q16. What is the function of the tight junctions? Ans: 16. They hold cells together.

Q17. What is the function of the desmosomes? Ans: 17. They provide mechanical strength.  
 Q18. What is the function of the hemidesmosomes? Ans: 18. They anchor the cell to the extracellular matrix.

Q19. What is the function of the gap junctions? Ans: 19. They allow communication between cells.  
 Q20. What is the function of the plasmogamy? Ans: 20. It is the fusion of cytoplasm.

Q21. What is the function of the karyogamy? Ans: 21. It is the fusion of nuclei.  
 Q22. What is the function of the meiosis? Ans: 22. It is a type of cell division that produces gametes.

Q23. What is the function of the mitosis? Ans: 23. It is a type of cell division that produces somatic cells.  
 Q24. What is the function of the cytokinesis? Ans: 24. It is the division of the cytoplasm.

Q25. What is the function of the prophase? Ans: 25. It is the first stage of mitosis.  
 Q26. What is the function of the metaphase? Ans: 26. It is the second stage of mitosis.

Q27. What is the function of the anaphase? Ans: 27. It is the third stage of mitosis.  
 Q28. What is the function of the telophase? Ans: 28. It is the fourth stage of mitosis.

Q29. What is the function of the cytokinesis? Ans: 29. It is the final stage of mitosis.  
 Q30. What is the function of the meiosis I? Ans: 30. It is the first division of meiosis.

Q31. What is the function of the meiosis II? Ans: 31. It is the second division of meiosis.  
 Q32. What is the function of the spermatogenesis? Ans: 32. It is the process of producing sperm.

Q33. What is the function of the oogenesis? Ans: 33. It is the process of producing eggs.  
 Q34. What is the function of the fertilization? Ans: 34. It is the fusion of a sperm and an egg.

Q35. What is the function of the zygote? Ans: 35. It is the fertilized egg.  
 Q36. What is the function of the cleavage? Ans: 36. It is the early stages of development.

Q37. What is the function of the gastrulation? Ans: 37. It is the process of forming the three germ layers.  
 Q38. What is the function of the neurulation? Ans: 38. It is the process of forming the neural tube.

Q39. What is the function of the organogenesis? Ans: 39. It is the process of forming organs.  
 Q40. What is the function of the embryonic development? Ans: 40. It is the process of developing from a zygote to a fetus.

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# Variety of Life

## MULTIPLE CHOICE QUESTIONS (MCQs)

1. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
2. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
3. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
4. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
5. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
6. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
7. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
8. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
9. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
10. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
11. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
12. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
13. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
14. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
15. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell
16. Which of the following is a eukaryotic cell?
  - ☐ A. Prokaryotic cell
  - ☐ B. Eukaryotic cell
  - ☐ C. Prokaryotic cell
  - ☐ D. Eukaryotic cell
17. Which of the following is a prokaryotic cell?
  - ☐ A. Eukaryotic cell
  - ☐ B. Prokaryotic cell
  - ☐ C. Eukaryotic cell
  - ☐ D. Prokaryotic cell

18. The first step in the development of multicellular organisms is the formation of a zygote. This is followed by cleavage, which results in a ball of cells called a morula. The morula then develops into a blastula, which is a hollow sphere of cells. The blastula then develops into a gastrula, which is a three-layered structure. The three layers are the ectoderm, the mesoderm, and the endoderm. The ectoderm gives rise to the skin and the nervous system. The mesoderm gives rise to the muscles and the circulatory system. The endoderm gives rise to the digestive system and the respiratory system.
19. The gastrula stage is characterized by the formation of the three germ layers. The ectoderm is the outermost layer, the mesoderm is the middle layer, and the endoderm is the innermost layer. Each layer has a specific fate and gives rise to different tissues and organs.
20. The gastrula stage is also characterized by the formation of the notochord. The notochord is a rod-like structure that runs along the length of the body. It is made of a soft, gelatinous material and is located between the ectoderm and the endoderm. The notochord eventually degenerates, but it plays an important role in the development of the vertebral column.
21. The gastrula stage is also characterized by the formation of the neural tube. The neural tube is a hollow tube that runs along the length of the body. It is made of a layer of cells called the neural plate. The neural plate folds inward to form the neural tube. The neural tube eventually gives rise to the brain and the spinal cord.
22. The gastrula stage is also characterized by the formation of the gut tube. The gut tube is a hollow tube that runs along the length of the body. It is made of a layer of cells called the gut plate. The gut plate folds inward to form the gut tube. The gut tube eventually gives rise to the digestive system.
23. The gastrula stage is also characterized by the formation of the coelom. The coelom is a body cavity that is lined by a layer of cells called the coelothelium. It is formed by the splitting of the mesoderm. The coelom eventually gives rise to the body cavity.
24. The gastrula stage is also characterized by the formation of the somites. The somites are blocks of tissue that are located on either side of the neural tube. They are made of cells from the mesoderm. The somites eventually give rise to the muscles and the vertebrae.
25. The gastrula stage is also characterized by the formation of the pharynx. The pharynx is a muscular tube that is located at the top of the digestive system. It is made of cells from the endoderm. The pharynx eventually gives rise to the throat and the esophagus.
26. The gastrula stage is also characterized by the formation of the anus. The anus is the opening at the end of the digestive system. It is made of cells from the endoderm. The anus eventually gives rise to the rectum and the anal canal.
27. The gastrula stage is also characterized by the formation of the mouth. The mouth is the opening at the front of the digestive system. It is made of cells from the endoderm. The mouth eventually gives rise to the oral cavity and the pharynx.
28. The gastrula stage is also characterized by the formation of the nose. The nose is the opening at the top of the respiratory system. It is made of cells from the ectoderm. The nose eventually gives rise to the nasal cavity and the nostrils.
29. The gastrula stage is also characterized by the formation of the ears. The ears are the openings at the sides of the head. They are made of cells from the ectoderm. The ears eventually give rise to the ear canal and the eardrum.
30. The gastrula stage is also characterized by the formation of the heart. The heart is a muscular organ that pumps blood throughout the body. It is made of cells from the mesoderm. The heart eventually gives rise to the heart muscle and the heart valves.
31. The gastrula stage is also characterized by the formation of the lungs. The lungs are organs that are responsible for breathing. They are made of cells from the endoderm. The lungs eventually give rise to the bronchi and the alveoli.
32. The gastrula stage is also characterized by the formation of the kidneys. The kidneys are organs that filter waste from the blood. They are made of cells from the mesoderm. The kidneys eventually give rise to the renal cortex and the renal medulla.
33. The gastrula stage is also characterized by the formation of the liver. The liver is a large organ that is responsible for producing bile and filtering toxins from the blood. It is made of cells from the endoderm. The liver eventually gives rise to the liver tissue and the bile ducts.
34. The gastrula stage is also characterized by the formation of the pancreas. The pancreas is a small organ that is responsible for producing insulin and digestive enzymes. It is made of cells from the endoderm. The pancreas eventually gives rise to the pancreatic islets and the pancreatic duct.
35. The gastrula stage is also characterized by the formation of the spleen. The spleen is an organ that is responsible for filtering blood and storing red blood cells. It is made of cells from the mesoderm. The spleen eventually gives rise to the splenic tissue and the splenic sinusoids.
36. The gastrula stage is also characterized by the formation of the thymus. The thymus is a small organ that is responsible for producing T-cells. It is made of cells from the mesoderm. The thymus eventually gives rise to the thymic cortex and the thymic medulla.
37. The gastrula stage is also characterized by the formation of the thyroid gland. The thyroid gland is a large organ that is responsible for producing thyroid hormone. It is made of cells from the endoderm. The thyroid gland eventually gives rise to the thyroid follicles and the thyroid sinusoids.
38. The gastrula stage is also characterized by the formation of the parathyroid glands. The parathyroid glands are small glands that are responsible for producing parathyroid hormone. They are made of cells from the endoderm. The parathyroid glands eventually give rise to the parathyroid cells and the parathyroid sinusoids.
39. The gastrula stage is also characterized by the formation of the adrenal glands. The adrenal glands are glands that are responsible for producing adrenal hormone. They are made of cells from the mesoderm. The adrenal glands eventually give rise to the adrenal cortex and the adrenal medulla.
40. The gastrula stage is also characterized by the formation of the pituitary gland. The pituitary gland is a small gland that is responsible for producing growth hormone. It is made of cells from the endoderm. The pituitary gland eventually gives rise to the pituitary cells and the pituitary sinusoids.



Number 43

8 May 1942

Rapid passage of ...

Legislation ...

### SHORT ANSWER QUESTIONS

1. Why parametric tests assume that ...
2. Justify ...
3. ...
4. ...

|        |         |
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| 1. ... | 2. ...  |
| 3. ... | 4. ...  |
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| 9. ... | 10. ... |

5. What is binomial nomenclature? What are the rules of nomenclature?
6. Binomial Nomenclature ...

| Common Names | Scientific Names |
|--------------|------------------|
| 1. ...       | ...              |
| 2. ...       | ...              |
| 3. ...       | ...              |



$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$

$\frac{1}{2} \log \frac{1}{2} = -1$

14) Wir definieren die Abbildung  $\alpha: \mathbb{R}^n \rightarrow \mathbb{R}^n$  durch

[illegible][illegible][illegible][illegible]

*[Illegible handwritten notes]*

$$T^{\mu}{}_{\nu} = \begin{bmatrix} \rho + p & 0 & 0 & 0 \\ 0 & p & 0 & 0 \\ 0 & 0 & p & 0 \\ 0 & 0 & 0 & p \end{bmatrix}$$

and at the same time, the

$$A_{\text{total}} = A_{\text{sample}} + A_{\text{background}}$$

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3. What are viruses and models  
 4. Draw a diagram of a virus

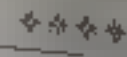
3a. Draw a diagram of a virus



4. State the similarities and differences between viruses and bacteria

### ESSAY TYPE QUESTIONS

- Q1. Write a note on biological classification of a plant  
 Q2. Describe the taxonomic system of Linnaeus in detail  
 Q3. Discuss the five kingdoms of classification proposed by Whittaker  
 Q4. Write a note on structure of viruses  
 Q5. Describe the structure of a virus (labelled diagram)  
 Q6. Sketch the structure of a virus  
 Q7. Explain structure of bacteriophage  
 Q8. Give some viral diseases which are common in Pakistan  
 Q9. Write a note on Acquired Immune Deficiency Syndrome (AIDS)  
 Q10. What is Hepatitis? List the symptoms and discuss its different types  
 Q11. Write a note on small-pox and polio  
 Q12. Explain the cycle of virus in bacteria  
 Q13. Describe the structure of a bacteriophage  
 Q14. Define virus. Write a note on the characteristics of viruses



CHAPTER 10

# Kingdom Prokaryotae (Monera)

## MULTIPLE CHOICE QUESTIONS (MCQ's)

1. All cells of a prokaryotic organism are identical.
  - A. True
  - B. False
2. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
3. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
4. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
5. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
6. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
7. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
8. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
9. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
10. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
11. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
12. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
13. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
14. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
15. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
16. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast
17. Which of the following is a prokaryotic organism?
  - A. E. coli
  - B. Paramecium
  - C. Amoeba
  - D. Yeast

- 1) The first step in the process of the cell cycle is the **A** **prophase** phase. During this phase, the chromosomes condense and the nuclear envelope breaks down.
- 2) The second step is the **B** **metaphase** phase. The chromosomes align at the metaphase plate in the center of the cell.
- 3) The third step is the **C** **anaphase** phase. The sister chromatids separate and move toward opposite poles of the cell.
- 4) The fourth step is the **D** **telophase** phase. The nuclear envelopes reform around the two sets of chromosomes.
- 5) The final step is the **E** **cytokinesis** phase. The cell membrane pinches off, resulting in two daughter cells.
- 6) The cell cycle is a continuous process that allows a cell to grow and divide. It is regulated by various proteins and hormones.
- 7) The cell cycle is essential for the growth and development of an organism. It also plays a role in tissue repair and cancer.
- 8) The cell cycle is a complex process that involves many steps and molecules. Understanding it is crucial for many areas of biology and medicine.
- 9) The cell cycle is a fundamental process in all living organisms. It is the basis of life and growth.
- 10) The cell cycle is a fascinating and complex process that continues to be studied and understood by scientists.

### SHORT ANSWER QUESTIONS

- Differentiate between liposarcomas and leiomyosarcomas.  
 Liposarcoma: composed of lipoblasts, characteristic of adipose tissue.  
 Leiomyosarcoma: composed of spindle-shaped cells, characteristic of smooth muscle.

Q. What are bacteria?

Ans. The smallest and simplest organisms are called bacteria. They are unicellular organisms.

Q. What do you mean by simple organisms?

Ans. Bacteria.

They are very small and simple organisms. They are unicellular organisms. They are found everywhere. They are present in soil, water, air, etc.

Q. How photosynthesis is carried out in green plants?

Ans. Photosynthesis is the process by which green plants use sunlight, carbon dioxide, and water to produce glucose and oxygen. The process takes place in the chloroplasts of the plant cells.

Q. Differentiate between photosynthesis and chemosynthesis.

Ans. Photosynthesis is the process by which green plants use sunlight, carbon dioxide, and water to produce glucose and oxygen. Chemosynthesis is the process by which certain bacteria use inorganic compounds to produce organic compounds.

Q. Name three types of changes in the form and structure of bacteria.

Ans. Changes in the form and structure of bacteria are: 1. Shape 2. Size 3. Color

Spiral Bacteria: These are bacteria which are spiral in shape. They are found in soil, water, etc.

Where are they found? In soil, water, etc.

ii. Spherobacteria: These are bacteria which are spherical in shape.

Where are they found? In soil, water, etc.

Q. What are polio and their functions?

Ans. Polio is a virus which causes paralysis. It is a very small and simple organism. It is found in soil, water, etc.

Functions of Polio:

1. It causes paralysis. 2. It is a very small and simple organism. 3. It is found in soil, water, etc.

ii. Polio appearance: It is a very small and simple organism.

Q. Differentiate between algae and fungi.

| Algae                              | Fungi                                |
|------------------------------------|--------------------------------------|
| 1. They are green in color.        | 1. They are white in color.          |
| 2. They are found in water.        | 2. They are found in soil.           |
| 3. They are simple organisms.      | 3. They are complex organisms.       |
| 4. They are unicellular organisms. | 4. They are multicellular organisms. |
| 5. They are found in soil.         | 5. They are found in water.          |
| 6. They are found in air.          | 6. They are found in soil.           |
| 7. They are found in water.        | 7. They are found in air.            |
| 8. They are found in soil.         | 8. They are found in water.          |
| 9. They are found in air.          | 9. They are found in soil.           |
| 10. They are found in water.       | 10. They are found in air.           |

Q. Discuss Fungi genome.

Ans. Fungi genome is the set of chromosomes which are found in the nucleus of the cell.

Q. What are plasmids and what is their role in genetic engineering?  
 Ans. Plasmids are small, circular, double-stranded DNA molecules that exist independently of the chromosomal DNA and are capable of replicating themselves. They are used in genetic engineering to transfer genes from one organism to another.

Q. Name four phases of bacterial growth.  
 Ans. The four phases of bacterial growth are: lag phase, log phase, stationary phase, and death phase.

Q. What are plasmids? Give their significance.

Ans. Plasmids are small, circular, double-stranded DNA molecules that exist independently of the chromosomal DNA and are capable of replicating themselves. They are used in genetic engineering to transfer genes from one organism to another. Plasmids are also used in the production of recombinant proteins and in the study of gene expression.

Q. Write physical methods to control bacteria.

Ans. Physical methods to control bacteria include:
 

1. Sterilization: The process of killing all microorganisms, including spores, by heat, radiation, or chemicals.
2. High temperature: The use of high temperatures to kill bacteria, such as autoclaving at 121°C for 15 minutes.
3. Radiation: The use of ionizing radiation to kill bacteria, such as gamma rays or ultraviolet light.
4. Membrane filtration: The use of filters to remove bacteria from liquids, such as ultrafiltration or microfiltration.

Q. What are mesosomes? What are they?

Ans. Mesosomes are membrane structures found in the cytoplasm of bacteria. They are thought to be involved in various cellular processes, such as cell division and energy metabolism.

Q. Functions of mesosomes.

Functions of mesosomes include:
 

1. Mesosomes are involved in cell division.
2. Mesosomes are involved in energy metabolism.
3. Mesosomes are involved in the transport of materials across the cell membrane.

1. Difficilobacterales are Gram positive and have a high G+C content.

Ans:

|  |  |
|--|--|
| <p>1. Difficilobacterales are Gram positive and have a high G+C content.</p> <p>2. They are found in soil and water.</p> <p>3. They are characterized by their ability to form spores.</p> <p>4. They are members of the phylum Firmicutes.</p> <p>5. They are known for their resistance to antibiotics.</p> <p>6. They are used in the production of antibiotics.</p> <p>7. They are found in the human gut.</p> <p>8. They are used in the production of cheese.</p> <p>9. They are used in the production of yogurt.</p> <p>10. They are used in the production of butyric acid.</p> | <p>1. Difficilobacterales are Gram positive and have a high G+C content.</p> <p>2. They are found in soil and water.</p> <p>3. They are characterized by their ability to form spores.</p> <p>4. They are members of the phylum Firmicutes.</p> <p>5. They are known for their resistance to antibiotics.</p> <p>6. They are used in the production of antibiotics.</p> <p>7. They are found in the human gut.</p> <p>8. They are used in the production of cheese.</p> <p>9. They are used in the production of yogurt.</p> <p>10. They are used in the production of butyric acid.</p> |
|--|--|

2. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

3. Why do some bacteria form spores?

Ans: Bacteria form spores to survive in harsh environments.

4. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

5. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

6. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

7. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

8. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

9. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

10. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

11. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

12. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

13. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

14. What is the difference between the two types of spores?

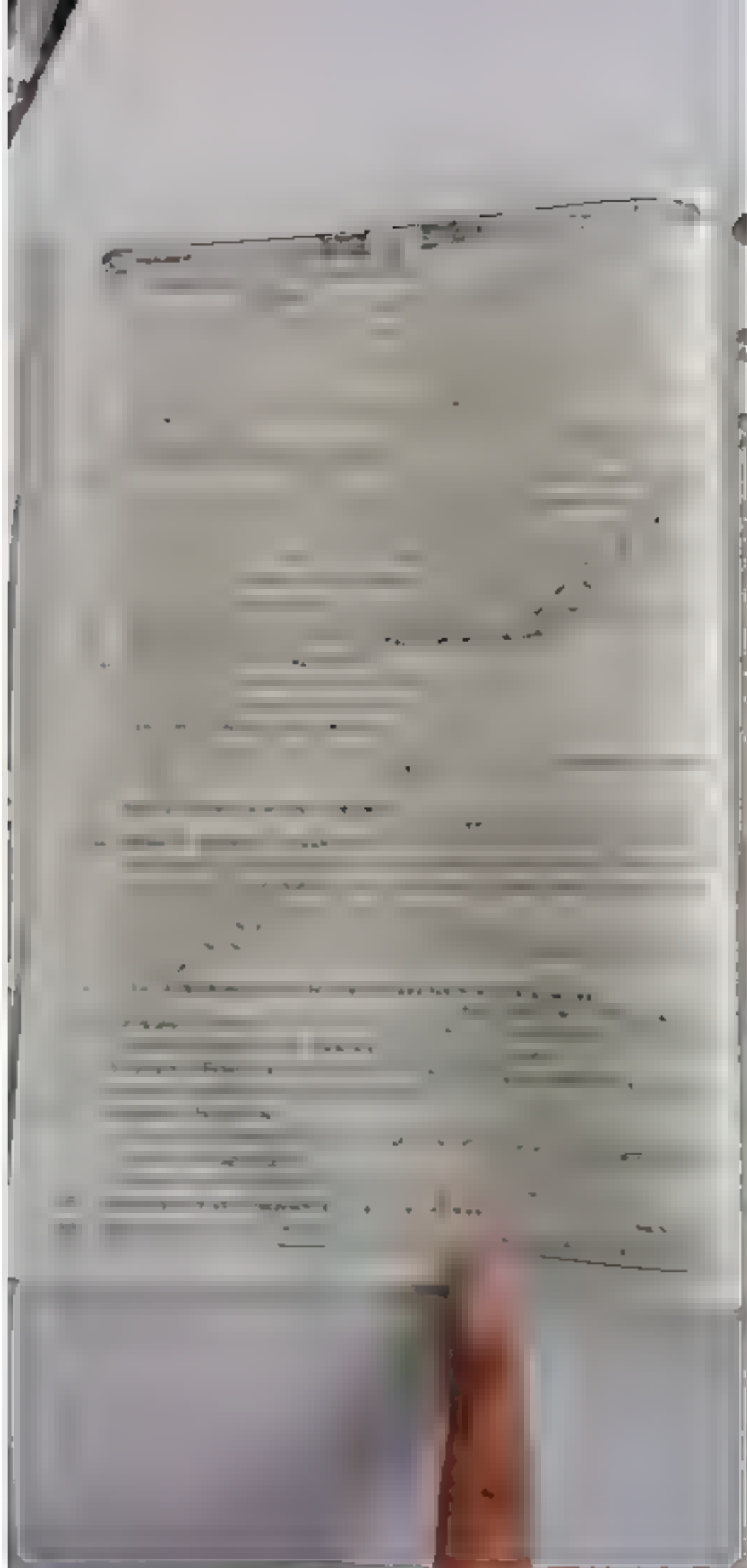
Ans: The two types of spores are endospores and exospores.

15. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.

16. What is the difference between the two types of spores?

Ans: The two types of spores are endospores and exospores.



1. **Introduction**  
 The purpose of this study is to investigate the effects of the independent variable on the dependent variable. The study is designed to provide a comprehensive understanding of the relationship between the two variables.

2. **Methodology**  
 The study employs a quantitative research design, utilizing a survey method to collect data from a sample of participants. The sample size is determined to be statistically significant, ensuring the reliability of the findings.

3. **Results**  
 The data analysis reveals a positive correlation between the independent variable and the dependent variable. The results indicate that as the independent variable increases, the dependent variable also tends to increase.

4. **Conclusion**  
 Based on the findings, it is concluded that there is a significant relationship between the independent variable and the dependent variable. The study suggests that further research is needed to explore the underlying mechanisms of this relationship.

5. **References**  
 The following references are cited in this study:  
 - Smith, J. (2018). The effects of X on Y. *Journal of Research*, 15(2), 123-135.  
 - Doe, A. (2019). Exploring the relationship between X and Y. *Academic Review*, 8(1), 45-58.  
 - Brown, C. (2020). A comprehensive study on X and Y. *Research Quarterly*, 30(3), 210-225.

Hamford 54

1. What are the different types of bacteria?

2. Describe the structure of a bacterial cell.

3. What are the different types of bacteria?

4. Describe the structure of a bacterial cell.

5. What are the different types of bacteria?

6. Describe the structure of a bacterial cell.

7. What are the different types of bacteria?

8. Describe the structure of a bacterial cell.

9. What are the different types of bacteria?

10. Describe the structure of a bacterial cell.

### ESSAY TYPE QUESTIONS

1. Write the different types of bacteria in the form of a table.
2. Explain about bacterial cell wall.
3. Compare Gram positive and Gram negative bacteria on the basis of cell wall.
4. Write a note on the cell envelope of bacteria.
5. Explain the process of nitrogen fixation in bacteria.
6. Write about growth and reproduction in bacteria.
7. Describe different physical and chemical methods to control bacteria.
8. Write a note on use and misuse of antibiotics.
9. Write a note on chemotherapy.
10. Write about physical methods to control microorganisms.
11. Write a note on respiration and growth in bacteria.
12. Describe different types of bacteria.



CHAPTER 07

# The Kingdom Protista (or Protoctista)

## MULTIPLE CHOICE QUESTIONS (MCQs)

1. Amoeba, paramecium, diatoms form spores at some stage in their life cycle.
 

A. True **I** B. False **II** C. Sometimes **III** D. None of these **IV**
2. Which are the two most important organelles of amoeba?
 

A. Cell wall **I** B. Contractile vacuole **II** C. Spindle fibres **III** D. Centrioles **IV**
3. Which of the following is not present in amoeba?
 

A. Nucleus **I** B. Mitochondrion **II** C. Chloroplast **III** D. Contractile vacuole **IV**
4. The organism which body is differentiated into head, thorax and abdomen is
 

A. Amoeba **I** B. Hydra **II** C. Paramecium **III** D. Ascaris **IV**
5. The closest relatives of fungi are
 

A. Bacteria **I** B. Plants **II** C. Slime molds **III** D. Green algae **IV**
6. Cryptomonas is an example of
 

A. A green alga **I** B. A cyanobacterium **II** C. A red alga **III** D. A brown alga **IV**
7. Protozoans having two nuclei are
 

A. Ciliates **I** B. Flagellates **II** C. Sporozoans **III** D. None of these **IV**
8. Ecologically, dinoflagellates are one of the most important groups of
 

A. Bacteria **I** B. Fungi **II** C. Plants **III** D. Animals **IV**
9. Amoebic dysentery is
 

A. A viral disease **I** B. A bacterial disease **II** C. A fungal disease **III** D. A parasitic disease **IV**
10. African sleeping sickness is transmitted by
 

A. A bacterium **I** B. A protozoan **II** C. A virus **III** D. A parasite **IV**
11. The phylum which is exclusively marine is
 

A. Rhizaria **I** B. Ciliophora **II** C. Chromista **III** D. Metazoa **IV**
12. Euglena is included in Kingdom
 

A. Monera **I** B. Protista **II** C. Fungi **III** D. Plantae **IV**
13. Which one belongs to Actinoptiles?
 

A. Tricoperona **I** B. Rhodospirillum rubrum **II** C. Rhodospirillum rubrum **III** D. Rhodospirillum rubrum **IV**
14. Amoeba moves by forming specialised cytoplasmic projection called
 

A. Flagella **I** B. Pseudopodia **II** C. Cilia **III** D. None of these **IV**
15. Fresh water spring is
 

A. Spring **I** B. Geysers **II** C. Hot spring **III** D. None of these **IV**
16. Lemniscus is an example of
 

A. A green alga **I** B. A brown alga **II** C. A red alga **III** D. A cyanobacterium **IV**
17. Pelomyxa, Parametrix, Ceratomyxa called
 

A. Endoparasites **I** B. Ectoparasites **II** C. Symbionts **III** D. None of these **IV**

SHORT ANSWER QUESTIONS

Q1. What is the kingdom Protista?  
Ans. The kingdom Protista is a group of eukaryotic organisms that are not plants, animals, or fungi. It includes a wide variety of organisms, from single-celled protists to multicellular organisms like algae and slime molds.

Q2. Name the three groups of protists.  
Ans. The three groups of protists are: 1. Unicellular protists (e.g., amoeba, paramecium), 2. Colonial protists (e.g., Volvox), and 3. Multicellular protists (e.g., kelp, red algae).

Q3. What is the difference between fungi and fungus-like protists?  
Ans. Fungi are eukaryotic organisms that have cell walls made of chitin and reproduce by spores. Fungus-like protists, on the other hand, are eukaryotic organisms that have cell walls made of cellulose and reproduce by spores. Some examples of fungus-like protists are slime molds and water molds.

Q4. Name any groups of animal-like protists.  
Ans. Some groups of animal-like protists are: 1. Ciliates (e.g., paramecium), 2. Flagellates (e.g., euglena), and 3. Amoebozoans (e.g., amoeba).

Q5. What are the similarities between fungi and fungus-like protists?  
Ans. Both fungi and fungus-like protists are eukaryotic organisms that have cell walls and reproduce by spores. They are also both heterotrophic organisms that obtain their food from other organisms.

Q6. What are the differences between fungi and fungus-like protists?  
Ans. Fungi have cell walls made of chitin, while fungus-like protists have cell walls made of cellulose. Fungi also have a more complex body structure than fungus-like protists.

Q7. What do you know about slime molds?  
Ans. Slime molds are fungus-like protists that live in moist, decaying organic matter. They are known for their ability to move and change shape, and they are often found in the form of long, thread-like structures called hyphae.

Q8. What do you know about water molds?  
Ans. Water molds are fungus-like protists that live in aquatic environments. They are known for their ability to decompose organic matter and are often found in the form of long, thread-like structures called hyphae.

Q. Why is the term *phagocytosis* used?

Ans. It is a process in which a cell engulfs a particle or a microorganism and destroys it.

Q. What are the functions of a phagocyte?

Ans. Phagocytes are cells that engulf and destroy foreign particles, bacteria, and viruses. They are found in all animals and are particularly abundant in the immune system.

### Benefits of Phagocytosis

- 1. It helps in the removal of pathogens and foreign particles from the body.
- 2. It helps in the repair of damaged tissues.
- 3. It helps in the regulation of the immune system.

Q. What are the types of phagocytes?

Ans. There are two main types of phagocytes: macrophages and neutrophils. Macrophages are larger cells that can engulf large particles, while neutrophils are smaller cells that can engulf small particles.

Q. What is the difference between a macrophage and a neutrophil?

Ans. Macrophages are larger cells that can engulf large particles, while neutrophils are smaller cells that can engulf small particles. Macrophages are found in all tissues, while neutrophils are found primarily in the blood.

Q. What are the functions of a macrophage?

Ans. Macrophages are cells that engulf and destroy foreign particles, bacteria, and viruses. They are found in all tissues and are particularly abundant in the immune system.

Q. What is the function of a neutrophil?

Ans. Neutrophils are cells that engulf and destroy foreign particles, bacteria, and viruses. They are found primarily in the blood and are particularly abundant in the immune system.

Q. What is the function of a phagocyte in the immune system?

Ans. Phagocytes are cells that engulf and destroy foreign particles, bacteria, and viruses. They are found in all tissues and are particularly abundant in the immune system.

Q. What is the difference between a macrophage and a neutrophil?

| Microphagous                                       | Macrophagous                                |
|--|---|
| Microphagous cells are smaller in size.            | Macrophages are larger in size.             |
| Microphagous cells are found in the blood.         | Macrophages are found in all tissues.       |
| Microphagous cells are found in the immune system. | Macrophages are found in the immune system. |



Q. What is the difference between a simple and a complex sentence?

A. A simple sentence contains only one independent clause. A complex sentence contains at least one independent clause and one or more dependent clauses.

Q. What is the difference between a subject and a predicate?

A. The subject is the part of the sentence that tells who or what the sentence is about. The predicate is the part of the sentence that tells what the subject does or is.

Q. What is the difference between a noun and a verb?

A. A noun is a word that names a person, place, thing, or idea. A verb is a word that expresses an action or a state of being.

Q. What are the parts of a sentence?

A. The parts of a sentence are the subject, the predicate, and the object.

Q. What is the difference between a noun and a pronoun?

A. A noun is a word that names a person, place, thing, or idea. A pronoun is a word that takes the place of a noun.

Q. What is the difference between a noun and an adjective?

A. A noun is a word that names a person, place, thing, or idea. An adjective is a word that describes a noun.

Q. What is the difference between a noun and an adverb?

A. A noun is a word that names a person, place, thing, or idea. An adverb is a word that describes an action or a state of being.

Q. What is the difference between a noun and a preposition?

A. A noun is a word that names a person, place, thing, or idea. A preposition is a word that shows the relationship between a noun and another word in a sentence.

Q. What is the difference between a noun and a conjunction?

A. A noun is a word that names a person, place, thing, or idea. A conjunction is a word that connects two words or phrases.

Q. What is the difference between a noun and a determiner?

A. A noun is a word that names a person, place, thing, or idea. A determiner is a word that identifies a noun.

Q. What is the difference between a noun and a modifier?

A. A noun is a word that names a person, place, thing, or idea. A modifier is a word that changes the meaning of a word.

Q. What is the difference between a noun and a complement?

A. A noun is a word that names a person, place, thing, or idea. A complement is a word that completes the meaning of a verb.

Q. What is the difference between a noun and a predicate nominative?

A. A noun is a word that names a person, place, thing, or idea. A predicate nominative is a noun that follows a linking verb and renames the subject.

Q. What is the difference between a noun and a predicate adjective?

A. A noun is a word that names a person, place, thing, or idea. A predicate adjective is an adjective that follows a linking verb and describes the subject.

Q. What is the difference between a noun and a subject complement?

A. A noun is a word that names a person, place, thing, or idea. A subject complement is a word that follows a linking verb and describes or renames the subject.

Q. What is the difference between a noun and an object complement?

A. A noun is a word that names a person, place, thing, or idea. An object complement is a word that follows a transitive verb and describes or renames the object.

Q. What is the difference between a noun and an indirect object?

A. A noun is a word that names a person, place, thing, or idea. An indirect object is a noun that receives the action of the verb.

Q. What is the difference between a noun and a direct object?

A. A noun is a word that names a person, place, thing, or idea. A direct object is a noun that receives the action of the verb.



44 356 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039

[illegible]

1. 1990年12月，某市发生一起重大火灾事故，造成多人伤亡和重大财产损失。事故发生后，市政府立即组织有关部门进行调查，并成立了一个由消防、公安、卫生等部门组成的联合调查组。调查组在调查过程中，发现该起火灾事故是由于该单位负责人违反消防安全规定，擅自改变建筑用途，导致消防设施失效所致。调查组在调查过程中，发现该单位负责人违反消防安全规定，擅自改变建筑用途，导致消防设施失效所致。

[illegible]

4114 *Phidippus* between jumping lizards and spiders (1989)

[illegible]

Why is it difficult to identify?

[illegible]

1. What are the bases of diversity in profluvium?

Minerals are found in the kingdom of plants like cereals, vegetables, fruits, etc. They are also found in animals like fish, birds, etc. Minerals are essential for the growth and development of all living organisms.

The minerals are classified into two groups: macrominerals and microminerals. Macrominerals are those which are required in large amounts (more than 100 mg per day) and microminerals are those which are required in small amounts (less than 100 mg per day).

The macrominerals include calcium, phosphorus, potassium, sodium, magnesium, sulfur, chlorine, and iodine. The microminerals include iron, zinc, copper, manganese, selenium, molybdenum, cobalt, nickel, chromium, vanadium, boron, silicon, fluorine, and strontium.

Minerals play a vital role in many biological processes. They are involved in the formation of bones and teeth, the regulation of fluid balance, the transmission of nerve impulses, the contraction of muscles, the synthesis of proteins, and the production of energy.

A deficiency of minerals can lead to various health problems. For example, a deficiency of calcium can lead to osteoporosis, a deficiency of iron can lead to anemia, and a deficiency of iodine can lead to goiter.

It is important to get enough minerals from your diet. You can do this by eating a variety of foods, including fruits, vegetables, grains, and animal products. If you have a mineral deficiency, your doctor may recommend taking a supplement.

Give an example of waste models, why it is in equilibrium.

21. Example 21 consists of a set of data on the number of...

[illegible]

\_\_\_\_\_

◆ ◆ ◆ ◆



CHAPTER 18

# Fungi (The Kingdom of Recyclers)

## MULTIPLE CHOICE QUESTIONS (MCQ's)

1. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
2. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
3. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
4. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
5. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
6. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
7. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
8. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
9. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
10. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
11. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
12. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
13. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
14. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
15. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
16. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
17. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
18. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
19. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores
20. Which of the following is not a typical appearance of fungi?
  - A. Mushrooms
  - B. Yeast
  - C. Mould
  - D. Spores

- [illegible]



### SHORT ANSWER QUESTIONS

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

1980

|  | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 | 2421 | 2422 | 2423 | 2424 | 2425 | 2426 | 2427 | 2428 | 2429 | 2430 | 2431 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Figure 6. The effect of the initial concentration of the monomer on the polymerization rate.

$\frac{1}{2} \left( \frac{1}{2} \right) = \frac{1}{4}$

4. **Keywords:** *depression, mood, rumination, self-esteem*

[illegible]

4.  $\phi$  函数:  $\phi(n)$  表示小于  $n$  的正整数中与  $n$  互质的数的个数。例如  $\phi(1)=1$ ,  $\phi(2)=1$ ,  $\phi(3)=2$ ,  $\phi(4)=2$ ,  $\phi(5)=4$ ,  $\phi(6)=2$ ,  $\phi(7)=6$ ,  $\phi(8)=4$ ,  $\phi(9)=6$ ,  $\phi(10)=4$ ,  $\phi(11)=10$ ,  $\phi(12)=4$ ,  $\phi(13)=12$ ,  $\phi(14)=6$ ,  $\phi(15)=8$ ,  $\phi(16)=8$ ,  $\phi(17)=16$ ,  $\phi(18)=6$ ,  $\phi(19)=18$ ,  $\phi(20)=8$ ,  $\phi(21)=12$ ,  $\phi(22)=10$ ,  $\phi(23)=22$ ,  $\phi(24)=8$ ,  $\phi(25)=20$ ,  $\phi(26)=12$ ,  $\phi(27)=18$ ,  $\phi(28)=12$ ,  $\phi(29)=28$ ,  $\phi(30)=8$ ,  $\phi(31)=30$ ,  $\phi(32)=16$ ,  $\phi(33)=20$ ,  $\phi(34)=16$ ,  $\phi(35)=24$ ,  $\phi(36)=12$ ,  $\phi(37)=36$ ,  $\phi(38)=18$ ,  $\phi(39)=24$ ,  $\phi(40)=16$ ,  $\phi(41)=40$ ,  $\phi(42)=12$ ,  $\phi(43)=42$ ,  $\phi(44)=20$ ,  $\phi(45)=24$ ,  $\phi(46)=22$ ,  $\phi(47)=46$ ,  $\phi(48)=16$ ,  $\phi(49)=42$ ,  $\phi(50)=20$ ,  $\phi(51)=32$ ,  $\phi(52)=24$ ,  $\phi(53)=52$ ,  $\phi(54)=24$ ,  $\phi(55)=40$ ,  $\phi(56)=24$ ,  $\phi(57)=36$ ,  $\phi(58)=28$ ,  $\phi(59)=58$ ,  $\phi(60)=16$ ,  $\phi(61)=60$ ,  $\phi(62)=30$ ,  $\phi(63)=24$ ,  $\phi(64)=32$ ,  $\phi(65)=48$ ,  $\phi(66)=20$ ,  $\phi(67)=66$ ,  $\phi(68)=32$ ,  $\phi(69)=44$ ,  $\phi(70)=24$ ,  $\phi(71)=70$ ,  $\phi(72)=24$ ,  $\phi(73)=72$ ,  $\phi(74)=36$ ,  $\phi(75)=40$ ,  $\phi(76)=36$ ,  $\phi(77)=60$ ,  $\phi(78)=24$ ,  $\phi(79)=78$ ,  $\phi(80)=32$ ,  $\phi(81)=54$ ,  $\phi(82)=40$ ,  $\phi(83)=82$ ,  $\phi(84)=24$ ,  $\phi(85)=68$ ,  $\phi(86)=42$ ,  $\phi(87)=56$ ,  $\phi(88)=40$ ,  $\phi(89)=88$ ,  $\phi(90)=24$ ,  $\phi(91)=72$ ,  $\phi(92)=44$ ,  $\phi(93)=60$ ,  $\phi(94)=46$ ,  $\phi(95)=72$ ,  $\phi(96)=32$ ,  $\phi(97)=96$ ,  $\phi(98)=48$ ,  $\phi(99)=64$ ,  $\phi(100)=40$ ,  $\phi(101)=100$ ,  $\phi(102)=32$ ,  $\phi(103)=102$ ,  $\phi(104)=48$ ,  $\phi(105)=48$ ,  $\phi(106)=52$ ,  $\phi(107)=106$ ,  $\phi(108)=36$ ,  $\phi(109)=108$ ,  $\phi(110)=40$ ,  $\phi(111)=72$ ,  $\phi(112)=48$ ,  $\phi(113)=112$ ,  $\phi(114)=56$ ,  $\phi(115)=88$ ,  $\phi(116)=56$ ,  $\phi(117)=72$ ,  $\phi(118)=58$ ,  $\phi(119)=96$ ,  $\phi(120)=32$ ,  $\phi(121)=110$ ,  $\phi(122)=60$ ,  $\phi(123)=100$ ,  $\phi(124)=60$ ,  $\phi(125)=100$ ,  $\phi(126)=36$ ,  $\phi(127)=126$ ,  $\phi(128)=64$ ,  $\phi(129)=104$ ,  $\phi(130)=48$ ,  $\phi(131)=130$ ,  $\phi(132)=40$ ,  $\phi(133)=112$ ,  $\phi(134)=68$ ,  $\phi(135)=72$ ,  $\phi(136)=64$ ,  $\phi(137)=136$ ,  $\phi(138)=56$ ,  $\phi(139)=138$ ,  $\phi(140)=48$ ,  $\phi(141)=96$ ,  $\phi(142)=70$ ,  $\phi(143)=132$ ,  $\phi(144)=64$ ,  $\phi(145)=120$ ,  $\phi(146)=72$ ,  $\phi(147)=96$ ,  $\phi(148)=72$ ,  $\phi(149)=148$ ,  $\phi(150)=40$ ,  $\phi(151)=150$ ,  $\phi(152)=72$ ,  $\phi(153)=108$ ,  $\phi(154)=80$ ,  $\phi(155)=124$ ,  $\phi(156)=48$ ,  $\phi(157)=156$ ,  $\phi(158)=78$ ,  $\phi(159)=104$ ,  $\phi(160)=64$ ,  $\phi(161)=144$ ,  $\phi(162)=72$ ,  $\phi(163)=162$ ,  $\phi(164)=80$ ,  $\phi(165)=80$ ,  $\phi(166)=82$ ,  $\phi(167)=166$ ,  $\phi(168)=48$ ,  $\phi(169)=156$ ,  $\phi(170)=72$ ,  $\phi(171)=108$ ,  $\phi(172)=84$ ,  $\phi(173)=172$ ,  $\phi(174)=72$ ,  $\phi(175)=120$ ,  $\phi(176)=80$ ,  $\phi(177)=176$ ,  $\phi(178)=88$ ,  $\phi(179)=178$ ,  $\phi(180)=48$ ,  $\phi(181)=180$ ,  $\phi(182)=84$ ,  $\phi(183)=156$ ,  $\phi(184)=88$ ,  $\phi(185)=172$ ,  $\phi(186)=80$ ,  $\phi(187)=180$ ,  $\phi(188)=92$ ,  $\phi(189)=108$ ,  $\phi(190)=72$ ,  $\phi(191)=188$ ,  $\phi(192)=64$ ,  $\phi(193)=192$ ,  $\phi(194)=96$ ,  $\phi(195)=80$ ,  $\phi(196)=144$ ,  $\phi(197)=196$ ,  $\phi(198)=72$ ,  $\phi(199)=198$ ,  $\phi(200)=80$ ,  $\phi(201)=160$ ,  $\phi(202)=100$ ,  $\phi(203)=180$ ,  $\phi(204)=72$ ,  $\phi(205)=200$ ,  $\phi(206)=104$ ,  $\phi(207)=144$ ,  $\phi(208)=80$ ,  $\phi(209)=192$ ,  $\phi(210)=48$ ,  $\phi(211)=210$ ,  $\phi(212)=104$ ,  $\phi(213)=156$ ,  $\phi(214)=106$ ,  $\phi(215)=172$ ,  $\phi(216)=72$ ,  $\phi(217)=204$ ,  $\phi(218)=110$ ,  $\phi(219)=156$ ,  $\phi(220)=72$ ,  $\phi(221)=210$ ,  $\phi(222)=104$ ,  $\phi(223)=222$ ,  $\phi(224)=80$ ,  $\phi(225)=160$ ,  $\phi(226)=110$ ,  $\phi(227)=226$ ,  $\phi(228)=72$ ,  $\phi(229)=228$ ,  $\phi(230)=80$ ,  $\phi(231)=120$ ,  $\phi(232)=112$ ,  $\phi(233)=232$ ,  $\phi(234)=72$ ,  $\phi(235)=230$ ,  $\phi(236)=116$ ,  $\phi(237)=156$ ,  $\phi(238)=84$ ,  $\phi(239)=238$ ,  $\phi(240)=64$ ,  $\phi(241)=240$ ,  $\phi(242)=110$ ,  $\phi(243)=162$ ,  $\phi(244)=116$ ,  $\phi(245)=168$ ,  $\phi(246)=80$ ,  $\phi(247)=232$ ,  $\phi(248)=120$ ,  $\phi(249)=204$ ,  $\phi(250)=100$ ,  $\phi(251)=250$ ,  $\phi(252)=72$ ,  $\phi(253)=250$ ,  $\phi(254)=122$ ,  $\phi(255)=160$ ,  $\phi(256)=128$ ,  $\phi(257)=256$ ,  $\phi(258)=132$ ,  $\phi(259)=252$ ,  $\phi(260)=80$ ,  $\phi(261)=180$ ,  $\phi(262)=130$ ,  $\phi(263)=262$ ,  $\phi(264)=80$ ,  $\phi(265)=260$ ,  $\phi(266)=132$ ,  $\phi(267)=180$ ,  $\phi(268)=136$ ,  $\phi(269)=268$ ,  $\phi(270)=72$ ,  $\phi(271)=270$ ,  $\phi(272)=136$ ,  $\phi(273)=120$ ,  $\phi(274)=270$ ,  $\phi(275)=160$ ,  $\phi(276)=120$ ,  $\phi(277)=276$ ,  $\phi(278)=138$ ,  $\phi(279)=180$ ,  $\phi(280)=64$ ,  $\phi(281)=280$ ,  $\phi(282)=132$ ,  $\phi(283)=282$ ,  $\phi(284)=140$ ,  $\phi(285)=180$ ,  $\phi(286)=132$ ,  $\phi(287)=280$ ,  $\phi(288)=80$ ,  $\phi(289)=276$ ,  $\phi(290)=80$ ,

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

4. The first machine is a direct type PDP-11.

[illegible]

Suppose that the number of people in a country is 100 million and that

$$\ln N_{\text{rem}} = \ln p_1 + \ln a + \ln T - \ln k_B g^2 \quad (10)$$

$\ln(f(x)) = \ln\left(\frac{1}{1+x^2}\right) = -\ln(1+x^2) = -\sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^{2n}}{n} = \sum_{n=1}^{\infty} \frac{(-1)^n x^{2n}}{n}$

[illegible][illegible][illegible]
$$x_0 = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \quad x_1 = \frac{1}{\sqrt{2}} \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
[illegible]

**Fungus**      A multicellular organism that produces its own food.

**What are symptoms?**

7. Wissenschaft ist die systematische Erforschung der Natur und der Gesellschaft.

הוא חתום על כל המסמכים הנדרשים, ויש לו את כל הסמכויות הדרושות.

\_\_\_\_\_

Role of fungi and algae in lichen upper portion in upper portion of lichen through the cortex in lichen.

biological importance of lichen.

1. It is a good source of food for many animals.

2. It is a good source of medicine as some lichen are used as antibiotics.

11. What is mycorrhizae? Give its types.

Ans. Mycorrhizae are mutualistic association between fungi and plant roots.

Types: There are two main types of mycorrhizae.

1. Ectomycorrhizae

2. Endomycorrhizae

Importance of Mycorrhizae for plants: The fungi helps increase the absorption of water and minerals by the plant in specially a prominent role in the roots of the plants. In the soil the roots of the plants have better growth with the help of the fungi. The fungi also helps in the uptake of the minerals and supplies them to the plant.

12. Define plasmodium.

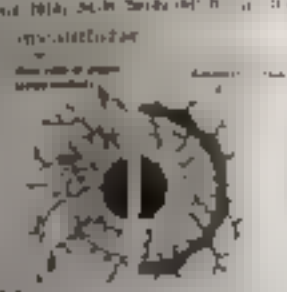
Ans. Plasmodium is a mass of cytoplasm known as plasmodium. When fungi of different species come together their nuclei fuse and form a single mass.

Define endomycorrhizae and ectomycorrhizae.

Ans. Endomycorrhizae and ectomycorrhizae are two types of mycorrhizae.

1. Endomycorrhizae: In this type of mycorrhizae the fungi hyphae penetrate the plant cells and form a mass of hyphae and minute branches and form a mass of hyphae and minute branches and form a mass of hyphae and minute branches.

2. Ectomycorrhizae: In this type of mycorrhizae the fungal hyphae are not inside the plant cells but they form a mass of hyphae and minute branches and form a mass of hyphae and minute branches.



14. What are saprophytic fungi? Give one example.

Ans. Saprophytic fungi are those fungi which feed on dead organic matter. They break down the dead organic matter and absorb the nutrients. Example: *Mucor* (mould).

15. Give features of zygomycota.

- Ans. Features of zygomycota:
  - i. Asexual reproduction: Spores formed directly by the fungus as hyphae.
  - ii. Sexual reproduction: Involves the formation of a thick-walled resistant structure called zygospore. Hence the name zygomycota.
  - iii. Meiosis takes place when zygospores germinate and haploid spores are produced.
  - iv. Spores on germination produce new mycelium. Asexual reproduction is common.
  - v. Rhizoids are absent.
  - vi. Rhizoids are growing in and spilling moist bread. Fruit on

10. Compare algae with a cyanobium

| Algae  | Cyanobium  |
|--|--|
| Algae are eukaryotic organisms. They have a nucleus and other organelles. They are found in aquatic and some terrestrial environments. | Cyanobium is a prokaryotic organism. It lacks a nucleus and other organelles. It is found in aquatic environments. |
| Algae are autotrophic and produce oxygen through photosynthesis.   | Cyanobium is autotrophic and produces oxygen through photosynthesis.   |
| Algae are found in various forms, including unicellular, colonial, and multicellular.  | Cyanobium is found in various forms, including unicellular, colonial, and multicellular.                           |

11. Why are lichens called crusts?

Ans. Lichens are called crusts because they form a thin, crust-like layer on rocks, soil, and other surfaces. They are composed of a symbiotic relationship between a fungus and an alga or cyanobacterium.



12. Why are lichens called crusts?

Ans. Lichens are called crusts because they form a thin, crust-like layer on rocks, soil, and other surfaces. They are composed of a symbiotic relationship between a fungus and an alga or cyanobacterium.

13. Differentiate between fungi and plants

| Fungi   | Plants  |
|---|---|
| Fungi are eukaryotic organisms. They lack chlorophyll and are heterotrophic. They are found in various environments, including soil, water, and on other organisms. | Plants are eukaryotic organisms. They have chlorophyll and are autotrophic. They are found in various environments, including land and water. |
| Fungi are found in various forms, including unicellular, colonial, and multicellular.   | Plants are found in various forms, including unicellular, colonial, and multicellular.  |
| Fungi are found in various habitats, including soil, water, and on other organisms.   | Plants are found in various habitats, including land and water.   |

14. Why are lichens called crusts?

Ans. Lichens are called crusts because they form a thin, crust-like layer on rocks, soil, and other surfaces. They are composed of a symbiotic relationship between a fungus and an alga or cyanobacterium.

15. Name and explain one and two cellular symbiotic associations

Ans. Lichens are a symbiotic association between a fungus and an alga or cyanobacterium. The fungus provides a protective structure for the alga, and the alga provides food for the fungus through photosynthesis. Another example is mycorrhizae, which is a symbiotic association between a fungus and a plant root. The fungus helps the plant absorb water and nutrients from the soil, and the plant provides food for the fungus.



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Q1. Give the following definitions in your own words.  
 a) Asexual reproduction  
 b) Sexual reproduction  
 c) Fertilisation  
 d) Meiosis  
 e) Mitosis

Q2. What are the following?  
 a) Bacteria  
 b) Fungi  
 c) Protozoa  
 d) Viruses  
 e) Algae

Q3. Name some edible fungi.  
 a) Mushrooms  
 b) Truffles  
 c) Morels  
 d) Boletus  
 e) Amanita

Q4. How do you distinguish between the following?

| Ascomycetes                                  | Basidiomycetes                                 |
|--|--|
| 1. They have asexual spores called conidia.  | 1. They have asexual spores called zoospores.  |
| 2. They have asexual spores called conidia.  | 2. They have asexual spores called zoospores.  |
| 3. They have asexual spores called conidia.  | 3. They have asexual spores called zoospores.  |
| 4. They have asexual spores called conidia.  | 4. They have asexual spores called zoospores.  |
| 5. They have asexual spores called conidia.  | 5. They have asexual spores called zoospores.  |
| 6. They have asexual spores called conidia.  | 6. They have asexual spores called zoospores.  |
| 7. They have asexual spores called conidia.  | 7. They have asexual spores called zoospores.  |
| 8. They have asexual spores called conidia.  | 8. They have asexual spores called zoospores.  |
| 9. They have asexual spores called conidia.  | 9. They have asexual spores called zoospores.  |
| 10. They have asexual spores called conidia. | 10. They have asexual spores called zoospores. |

Q5. Compare Ascomycetes with Basidiomycetes.

| Ascomycetes                                  | Basidiomycetes                                 |
|--|--|
| 1. They have asexual spores called conidia.  | 1. They have asexual spores called zoospores.  |
| 2. They have asexual spores called conidia.  | 2. They have asexual spores called zoospores.  |
| 3. They have asexual spores called conidia.  | 3. They have asexual spores called zoospores.  |
| 4. They have asexual spores called conidia.  | 4. They have asexual spores called zoospores.  |
| 5. They have asexual spores called conidia.  | 5. They have asexual spores called zoospores.  |
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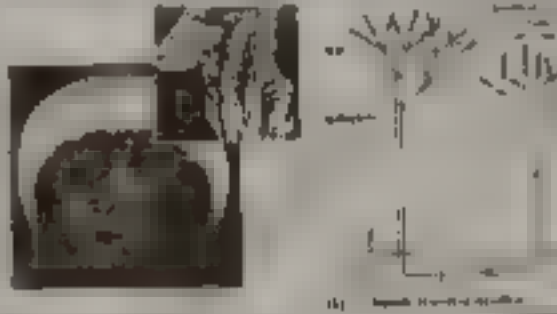
Q6. What are some fungi called as predators?  
 a) Fungi as predators  
 b) Fungi as predators  
 c) Fungi as predators  
 d) Fungi as predators  
 e) Fungi as predators

Q7. Name the type of hyphae and sexual spores in sac fungi.  
 a) Type of hyphae in sac fungi  
 b) Type of sexual spores in sac fungi  
 c) Type of hyphae in sac fungi  
 d) Type of sexual spores in sac fungi  
 e) Type of hyphae in sac fungi

Q. Write down the seven products and their names.  
 Ans. Seven products are: 1. Wheat, 2. Rice, 3. Maize, 4. Jowar, 5. Bajra, 6. Sorghum, 7. Millets.

Q. What do you mean by budding and photosynthesis?  
 Ans. Budding is a form of asexual reproduction in which a new individual grows out of the parent body. Photosynthesis is the process by which green plants convert light energy into chemical energy in the form of glucose.

Q. Sketch a diagram of a plant showing the process of photosynthesis.



Q. Write down the importance of photosynthesis.  
 Ans. The importance of photosynthesis is that it provides food for all living organisms and releases oxygen into the atmosphere.

Q. Write the importance of pink bread mold in food industry and genetics.  
 Ans. The importance of pink bread mold (Aspergillus niger) is that it is used in the production of various food products and is also used in genetic engineering.

Q. Write down importance of yeast.  
 Ans. The importance of yeast is that it is used in the production of bread, beer, and wine, and it is also used in genetic engineering.

Q. What are the major fungal diseases caused by fungi?  
 A. Aspergillus, Candida, Cryptococcus, Histoplasma, etc.

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|                                       |       |
|---------------------------------------|-------|
| 1. Fungi are eukaryotic organisms.    | True  |
| 2. Fungi are prokaryotic organisms.   | False |
| 3. Fungi are unicellular organisms.   | False |
| 4. Fungi are multicellular organisms. | True  |
| 5. Fungi are autotrophic organisms.   | False |
| 6. Fungi are heterotrophic organisms. | True  |
| 7. Fungi are saprophytic organisms.   | True  |
| 8. Fungi are parasitic organisms.     | True  |
| 9. Fungi are mutualistic organisms.   | True  |
| 10. Fungi are commensal organisms.    | True  |

**SHORT TYPE QUESTIONS**

1. Define the term 'Fungi'.
2. Write the different modes of nutrition in Fungi.
3. What do you know about mycorrhizal relationship in Fungi?
4. Describe the role of fungi in the environment.
5. Write a short account on fungi which are used in food and beverages.
6. Write a short account on reproduction in fungi.
7. Discuss the different methods of fungal reproduction in fungi.
8. Write the role and importance of fungi in the environment.
9. Write a short account of Aspergillus.
10. Write a short account of Penicillium.
11. Write the different uses of fungi in the environment.
12. Write the different uses of fungi in the industry.
13. Write the different uses of fungi in the agriculture.
14. Write the different uses of fungi in the medicine.
15. Write the different uses of fungi in the food and beverages.
16. Write the different uses of fungi in the cosmetics.
17. Write the different uses of fungi in the paper and pulp.
18. Write the different uses of fungi in the leather.
19. Write the different uses of fungi in the textile.
20. Write the different uses of fungi in the construction.



# Kingdom Plantae

## MULTIPLE CHOICE QUESTIONS (MCQs)

1. The period in which the angiosperm seed plant originated is  
☒ A. Cretaceous ☐ B. Paleogene ☐ C. Mesozoic ☐ D. Paleozoic
2. The biological name of wheat is  
☐ A. *Triticum aestivum* ☐ B. *Triticum vulgare* ☐ C. *Triticum durum* ☐ D. *Triticum spelta*
3. The first step in the evolution of plants is  
☐ A. photosynthesis ☐ B. cell wall formation ☐ C. multicellularity ☐ D. alternation of generations
4. The first step in the evolution of plants is  
☐ A. photosynthesis ☐ B. cell wall formation ☐ C. multicellularity ☐ D. alternation of generations
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☐ A. photosynthesis ☐ B. cell wall formation ☐ C. multicellularity ☐ D. alternation of generations
6. The first step in the evolution of plants is  
☐ A. photosynthesis ☐ B. cell wall formation ☐ C. multicellularity ☐ D. alternation of generations
7. The first step in the evolution of plants is  
☐ A. photosynthesis ☐ B. cell wall formation ☐ C. multicellularity ☐ D. alternation of generations
8. Which one of the following is not a plant?  
☐ A. *Volvox* ☐ B. *Chlamydomonas* ☐ C. *Chara* ☐ D. *Ulva*
9. Angiosperms are plants that  
☐ A. have seeds ☐ B. have flowers ☐ C. have fruits ☐ D. have all of these
10. Angiosperms are plants that  
☐ A. have seeds ☐ B. have flowers ☐ C. have fruits ☐ D. have all of these
11. Angiosperms are plants that  
☐ A. have seeds ☐ B. have flowers ☐ C. have fruits ☐ D. have all of these
12. The male gametophyte of angiosperms is  
☐ A. anther ☐ B. stamen ☐ C. pollen ☐ D. pistil
13. A haploid spermatozoid fuses with the haploid egg in a process called  
☐ A. fertilization ☐ B. meiosis ☐ C. mitosis ☐ D. cytokinesis
14. In mosses, archegonia and antheridia (mixed with sterile hairs) are called  
☐ A. sporophytes ☐ B. gametophytes ☐ C. sporangia ☐ D. gametes
15. Megaspore within megasporangium develops into  
☐ A. embryo ☐ B. zygote ☐ C. larva ☐ D. embryo sac
16. Fern Prothallus is  
☐ A. sporophyte ☐ B. gametophyte ☐ C. sporangium ☐ D. gamete

1. A seed is sealed in the wall of  
A. Endosperm B. Embryo C. Pericarp D. Seed coat
2. Which one of the following is not a part of a seed?  
A. Embryo B. Endosperm C. Pericarp D. Seed coat
3. Plants are said to be amphibious if they  
A. Grow in water B. Grow on land C. Grow in both water and land D. Grow in both water and air
4. Bryophytes are generally thought to have evolved from  
A. Green algae B. Red algae C. Blue-green algae D. Brown algae
5. The simplest of all bryophytes are  
A. Liverworts B. Mosses C. Hornworts D. All of these
6. The system of classification which reflects the natural relationship among the organisms and their mode of origin is  
A. Artificial B. Natural C. Phylogenetic D. Phenetic
7. The sporophyte of bryophytes is  
A. Diploid B. Tetraploid C. Hexaploid D. Octaploid
8. Which one is an example of non-vascular plants?  
A. Bryophytes B. Pteridophytes C. Gymnosperms D. Angiosperms
9. Moss is an example of  
A. Bryophytes B. Pteridophytes C. Gymnosperms D. Angiosperms
10. Flowering plants belong to the class  
A. Angiosperms B. Gymnosperms C. Pteridophytes D. Bryophytes
11. Mosses are  
A. Bryophytes B. Pteridophytes C. Gymnosperms D. Angiosperms
12. Non-vascular bryophytes are found in  
A. Wet places B. Dry places C. Both A and B D. None of these
13. A haploid sporophyte produces with haploid egg to produce diploid  
A. Zygote B. Spore C. Gamete D. Zygote
14. A bryophyte is further subdivided into  
A. Liverworts B. Mosses C. Hornworts D. All of these
15. The plants that have no fixed sex and gametophyte dominant habit are  
A. Bryophytes B. Pteridophytes C. Gymnosperms D. Angiosperms
16. The part of flower which develops into fruit is  
A. Petal B. Sepal C. Ovary D. Anther
17. The megasporophylls bearing ovules are not folded and joined at the margins to form an ovary  
A. True B. False C. Sometimes D. None of these
18. In Anthoceros a sporophyte at the junction of foot and spore producing region form  
A. Paraphysis B. Meristematic tissue C. Phloem D. Xylem
19. The reproductive organ of sporophyte is  
A. Sporangium B. Antheridium C. Archegonium D. All of these

41. A heterostylous flower is one in which
  - A. the stamens and pistils are of different lengths
  - B. the stamens and pistils are of different shapes
  - C. the stamens and pistils are of different colors
  - D. the stamens and pistils are of different sizes
42. In the gametophyte of mosses and liverworts, the gametophyte is
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
43. Fern gametophytes are found in
  - A. the soil
  - B. the water
  - C. the air
  - D. the ground
44. Strobili in the sporophyte of mosses are
  - A. small, green, leafy plants
  - B. small, green, leafy plants with a long, thin, green, leafy stem
  - C. small, green, leafy plants with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. small, green, leafy plants with a long, thin, green, leafy stem and a long, thin, green, leafy stem
45. The plant of sphenopterids is called as
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
46. Small leaves having a single undivided vein are called
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
47. A flower is said to be
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
48. Botanically a seed can be defined as a
  - A. small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
49. The gametophyte of mosses is
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
50. After fertilization
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
51. Which of the following is a non-flowering plant?
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
52. Name the class that contains seedless plants
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
53. Female gametophyte in flowering plants is
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
54. The part of flower which develops into fruit is
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
55. Double Fertilization is a special process found in
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
56. In flowering plant, ovary wall develops into
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
57. Nectar
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
58. Pollen grains develop from haploid microspores then later develop into sperm bearing
  - A. a small, green, leafy plant
  - B. a small, green, leafy plant with a long, thin, green, leafy stem
  - C. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem
  - D. a small, green, leafy plant with a long, thin, green, leafy stem and a long, thin, green, leafy stem



Q. Write the names of the following plants.

A. 1. *Pinus* 2. *Quercus* 3. *Abies* 4. *Larix* 5. *Taxus*

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Q1. What is the embryo axis of *Helianthus*?

Ans. The embryo axis of *Helianthus* is shown in the figure. It consists of the shoot apical meristem, the plumule, the cotyledons, the epicotyl, the hypocotyl, and the root apical meristem. The shoot apical meristem is located at the tip of the shoot, and the root apical meristem is located at the tip of the root. The cotyledons are the seed leaves, and the epicotyl is the shoot axis above the cotyledons. The hypocotyl is the shoot axis below the cotyledons.

Q2. What is double fertilization?

Ans. Double fertilization is a process in which two sperm cells fertilize two egg cells. One sperm cell fertilizes the egg cell to form a zygote, and the other sperm cell fertilizes the central cell to form a triploid endosperm. This process is unique to angiosperms.

Q3. Define ovule and embryo sac.

Ans. An ovule is a structure in the ovary of a flower that contains the egg cell. It is the female gametophyte. The embryo sac is a structure in the ovule that contains the egg cell, the central cell, and two polar nuclei. It is the female gametophyte.

Q4. Define seed and fruit.

Ans. A seed is a structure that contains the embryo of a plant. It is the product of fertilization. A fruit is a structure that contains the seed. It is the mature ovary of a flower.

Q5. Differentiate between homospory and heterospory.

| Homospory   | Heterospory   |
|---|---|
| 1. In homospory, the gametophyte is bisexual and produces both male and female gametes. | 1. In heterospory, the gametophyte is unisexual and produces either male or female gametes. |
| 2. Example: <i>Adiantum</i> .   | 2. Example: <i>Salvinia</i> .   |

Q6. Give four examples of gymnosperms given in your book.

Ans. Examples of gymnosperms are:

- Pinus
- Picea
- Juniperus
- Cedrus

Q7. What are gymnosperms? Give examples.

Ans. Gymnosperms are seed-producing plants that do not have flowers or fruits. They are usually woody plants. Examples of gymnosperms are Pinus, Picea, Juniperus, and Cedrus.



Standard P.L. 86-607  
Biology Interview and P.L.  
White House, etc. to study and research values of plants  
Female values of P.L.  
Male values of P.L.  
Female values of P.L.  
Male values of P.L.

State the structure of female gametophyte of an Angiosperm.  
Structure of female gametophyte of an Angiosperm  
The female gametophyte of an Angiosperm is a small, multicellular, haploid structure that develops from a single egg cell. It is located within the ovule of the ovary. The female gametophyte consists of the egg cell, two synergids, and three antipodal cells. The egg cell is the female gamete, and the synergids and antipodal cells are accessory cells that help in the development of the embryo sac.

1) State the structure of male gametophyte of an Angiosperm.  
Structure of male gametophyte of an Angiosperm  
The male gametophyte of an Angiosperm is a small, multicellular, haploid structure that develops from a single pollen grain. It is located within the pollen tube. The male gametophyte consists of the pollen tube, two vegetative cells, and two generative cells. The pollen tube is the male gamete, and the vegetative cells and generative cells are accessory cells that help in the development of the pollen tube.

2) State the structure of male gametophyte of an Angiosperm.  
Structure of male gametophyte of an Angiosperm  
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3) State the structure of male gametophyte of an Angiosperm.  
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4) State the structure of male gametophyte of an Angiosperm.  
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5) State the structure of male gametophyte of an Angiosperm.  
Structure of male gametophyte of an Angiosperm  
The male gametophyte of an Angiosperm is a small, multicellular, haploid structure that develops from a single pollen grain. It is located within the pollen tube. The male gametophyte consists of the pollen tube, two vegetative cells, and two generative cells. The pollen tube is the male gamete, and the vegetative cells and generative cells are accessory cells that help in the development of the pollen tube.

Importance of Double Fertilization in Food Storage. The importance of double fertilization in food storage is that it results in the formation of a zygote, which is the first cell of the new embryo. The zygote is a diploid cell, and it is the only cell that can develop into a new plant. The zygote is the first cell of the new embryo, and it is the only cell that can develop into a new plant. The zygote is the first cell of the new embryo, and it is the only cell that can develop into a new plant.



44. Write four characteristics of amphibians.  
 Ans. four characteristics of amphibians are:  
 1. First and Fourth: They are cold-blooded.  
 2. Second: They are poikilothermic.  
 3. Third: They are aquatic in their early life stages.  
 4. Fourth: They are terrestrial in their later life stages.

45. Write four characteristics of reptiles.  
 Ans. four characteristics of reptiles are:  
 1. First: They are cold-blooded.  
 2. Second: They are poikilothermic.  
 3. Third: They are terrestrial.  
 4. Fourth: They are oviparous.

46. Write four characteristics of birds.  
 Ans. four characteristics of birds are:  
 1. First: They are warm-blooded.  
 2. Second: They are homeothermic.  
 3. Third: They are terrestrial.  
 4. Fourth: They are oviparous.

47. Write four characteristics of mammals.  
 Ans. four characteristics of mammals are:  
 1. First: They are warm-blooded.  
 2. Second: They are homeothermic.  
 3. Third: They are terrestrial.  
 4. Fourth: They are viviparous.

48. What are amphibians?  
 Ans. Amphibians are a class of animals that live both in water and on land.

49. What are reptiles?  
 Ans. Reptiles are a class of animals that live on land and are cold-blooded.

50. What are birds?  
 Ans. Birds are a class of animals that live on land and are warm-blooded.

51. What are mammals?  
 Ans. Mammals are a class of animals that live on land and are warm-blooded.

52. Define double fertilization in Angiosperms.  
 Ans. Double fertilization is a process in which two sperm cells fertilize two egg cells.

53. Write four characteristics of Angiosperms.  
 Ans. four characteristics of Angiosperms are:  
 1. First: They are warm-blooded.  
 2. Second: They are homeothermic.  
 3. Third: They are terrestrial.  
 4. Fourth: They are oviparous.

Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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### DELAY TYPE CAPSULES

[illegible][illegible][illegible]

4. התאמת התוכן לתוכנית הלימודים

Figure 1. The effect of the concentration of the solution on the rate of the reaction.

In 1980, the first step was taken towards the development of a new system.

— 1980 —

1997-1998

Q. Now, you're not going to say that the defendant was not a person of good character, are you?

10. The first step in the development of the system is the selection of the appropriate hardware and software components. This step is crucial as it determines the system's performance and scalability. The selection process involves evaluating various options based on factors such as cost, reliability, and compatibility.

|  |      |      |
|--|------|------|
| Example 2: The rate of change of the volume of a plant | 1000 | 1000 |
| Discrepancy between the expected and actual results    | 1000 | 1000 |

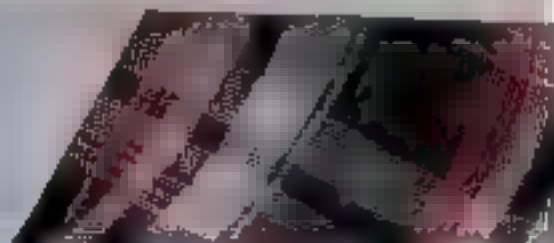
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Angiosperms differ from gymnosperms

4. Differentiate between microphylls and megaphylls and describe evolution of

5. Write down a translation of the claim  $\exists n \forall m (n > m)$ .

☆ **Disc-a-life cycle of Morden hair fern** ☆☆☆☆



CHAPTER 8

# Kingdom Animalia

## MULTIPLE CHOICE QUESTIONS (MCQs)

1. Which is not a characteristic of animals?
- A. They are heterotrophic. B. They are eukaryotic. C. They are multicellular. D. They are autotrophic.
2. Which is not a characteristic of animals?
- A. They are heterotrophic. B. They are eukaryotic. C. They are multicellular. D. They are autotrophic.
3. The integumentary and nervous system is developed from
- A. ectoderm. B. mesoderm. C. endoderm. D. all of these.
4. The animals which have a body cavity is called
- A. coelomate. B. acoelomate. C. pseudocoelomate. D. none of these.
5. The body cavity of Nematode is
- A. acoelomate. B. pseudocoelomate. C. coelomate. D. none of these.
6. The body cavity of molluscs is called
- A. coelom. B. pseudocoelom. C. acoelom. D. none of these.
7. In molluscs, a blue coloured substance pigment is
- A. haemoglobin. B. haemocyanin. C. haemerythrin. D. none of these.
8. The skeletal system found in sponges is called
- A. spicules. B. multiple. C. single. D. none of these.
9. Pseudocoelom is present in
- A. earthworm. B. amoeba. C. Hydra. D. none of these.
10. Pseudocoelom is characteristic feature of
- A. annelids. B. nematodes. C. flatworms. D. all of these.
11. The cartilaginous fishes contain
- A. no. B. few. C. many. D. all of these.
12. Which is the sequence of bones in the mammalian ear?
- A. Hammer, Anvil, Stirrup. B. Hammer, Stirrup, Anvil. C. Stirrup, Hammer, Anvil. D. Stirrup, Anvil, Hammer.
13. The inner layer of our tongue is called
- A. Pseudo. B. Epithelium. C. Mucosa. D. All of these.
14. Number of legs in arachnids is
- A. 4. B. 6. C. 8. D. 10.
15. Animals that have their body cavity filled with coelom are called
- A. acoelomate. B. pseudocoelomate. C. coelomate. D. none of these.



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- 55 ... ..
- 56 ... ..

1. The first step in the process of developing a business plan is to conduct a market analysis. This involves identifying the target market, estimating the size of the market, and determining the competitive environment.
2. The second step is to develop a marketing strategy. This involves determining the company's overall marketing objectives and the specific marketing mix (product, price, place, and promotion) that will be used to achieve these objectives.
3. The third step is to develop a financial plan. This involves estimating the company's costs, revenues, and profits over a period of time.
4. The fourth step is to develop an implementation plan. This involves determining the specific actions that will be taken to implement the marketing and financial plans.
5. The fifth step is to monitor and evaluate the progress of the business plan. This involves comparing actual results with the plan and making adjustments as needed.

### SHORT ANSWER QUESTIONS

1. What are the three main components of a business plan?
2. What is the purpose of a market analysis?
3. What is the marketing mix?
4. What is the financial plan?
5. What is the implementation plan?
6. What is the purpose of monitoring and evaluating the business plan?



Handwritten notes on lined paper, likely a page from a notebook. The text is written in cursive and is mostly illegible due to blurring and fading. The notes are organized into several paragraphs, with some lines underlined. The handwriting is dense and fills most of the page.

# Handwritten title and header information at the top of the page.

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# Chapter 10: The Phylum Cnidaria

Q. What does the word 'cnidocytes' mean?

Ans. Importance of cnidocytes  
Cnidocytes are found in the skin of cnidarians. They are used for defense and capturing prey. They contain a capsule called a cnidoblast which discharges a thread containing a toxin called nematocyst.

Q. What are Parus and Metus?

Ans. Parus is the larval stage of a cnidarian. Metus is the adult stage. They are both found in the same colony.

Q. How do they differ from other cnidarians?

| Parus                                   | Metus                                    |
|---|--|
| 1. They are small and live in colonies. | 1. They are larger and live in colonies. |
| 2. They have a simple body plan.        | 2. They have a more complex body plan.   |
| 3. They are found in shallow water.     | 3. They are found in deeper water.       |
| 4. They are found in the same colony.   | 4. They are found in the same colony.    |

Q. What are the differences?

Ans. Cnidocytes are found in the skin of cnidarians. They are used for defense and capturing prey.

Q. Differentiate between polyps and medusae.

| Polyps  | Medusae  |
|---|--|
| 1. They are sessile animals which live in colonies.   | 1. They are free swimming animals.                     |
| 2. They reproduce asexually and give rise to medusae. | 2. Medusae reproduce sexually and give rise to polyps. |

Q. What are coral reefs?

Ans. Coral Reefs are large structures made of calcium carbonate. They are found in shallow water. They are formed by the accumulation of the skeletons of dead corals. They are important for marine life.

Q. Give the reproduction in planarians.

Ans. Reproduction in Planarians. Planarians reproduce asexually by fission. They can also reproduce sexually.

1. The first part of the text discusses the importance of understanding the structure of the cell. It mentions the nucleus, which contains the genetic material, and the cytoplasm, where most of the cell's metabolic activities take place. The text also mentions the cell membrane, which separates the cell from its environment.

2. The second part of the text discusses the process of photosynthesis. It explains how plants use light energy to convert carbon dioxide and water into glucose and oxygen. The text also mentions the chloroplasts, which are the organelles where photosynthesis takes place.

3. The third part of the text discusses the process of cellular respiration. It explains how cells use oxygen to break down glucose and release energy. The text also mentions the mitochondria, which are the organelles where cellular respiration takes place.

4. The fourth part of the text discusses the importance of the cell wall in plant cells. It explains how the cell wall provides structural support and protection for the cell. The text also mentions the cellulose, which is a major component of the cell wall.

1. The importance of the nervous system in the control of the body's functions.

2. The functions of the brain and spinal cord.

3. The functions of the peripheral nervous system.

4. The functions of the autonomic nervous system.

5. The functions of the endocrine system.

6. The functions of the reproductive system.

7. The functions of the digestive system.

8. The functions of the circulatory system.

9. The functions of the respiratory system.

10. The functions of the excretory system.

11. The functions of the immune system.

12. The functions of the integumentary system.

13. The functions of the skeletal system.

14. The functions of the muscular system.

15. The functions of the sensory system.

16. The functions of the motor system.

17. The functions of the nervous system.

18. The functions of the endocrine system.

19. The functions of the reproductive system.

20. The functions of the digestive system.

21. The functions of the circulatory system.

22. The functions of the respiratory system.

23. The functions of the excretory system.

24. The functions of the immune system.

25. The functions of the integumentary system.

26. The functions of the skeletal system.

27. The functions of the muscular system.

28. The functions of the sensory system.

29. The functions of the motor system.

30. The functions of the nervous system.

31. The functions of the endocrine system.

32. The functions of the reproductive system.

33. The functions of the digestive system.

34. The functions of the circulatory system.

35. The functions of the respiratory system.

**Section 1: Basic Grammar and Vocabulary**

1. The first part of the lesson covers basic grammar rules and vocabulary. It includes exercises on sentence structure and word usage.

2. The second part of the lesson focuses on reading comprehension. Students are asked to read a short passage and answer questions about it.

3. The third part of the lesson is a writing exercise. Students are asked to write a short paragraph about their favorite hobby.

4. The fourth part of the lesson is a listening exercise. Students are asked to listen to a short audio clip and answer questions about it.

5. The fifth part of the lesson is a speaking exercise. Students are asked to participate in a role-play activity.

6. The sixth part of the lesson is a grammar review. Students are asked to complete exercises on various grammar points.

7. The seventh part of the lesson is a vocabulary review. Students are asked to complete exercises on word recognition and usage.

8. The eighth part of the lesson is a reading comprehension exercise. Students are asked to read a short passage and answer questions about it.

9. The ninth part of the lesson is a writing exercise. Students are asked to write a short paragraph about their favorite hobby.

10. The tenth part of the lesson is a listening exercise. Students are asked to listen to a short audio clip and answer questions about it.

11. The eleventh part of the lesson is a speaking exercise. Students are asked to participate in a role-play activity.

12. The twelfth part of the lesson is a grammar review. Students are asked to complete exercises on various grammar points.

13. The thirteenth part of the lesson is a vocabulary review. Students are asked to complete exercises on word recognition and usage.

14. The fourteenth part of the lesson is a reading comprehension exercise. Students are asked to read a short passage and answer questions about it.

15. The fifteenth part of the lesson is a writing exercise. Students are asked to write a short paragraph about their favorite hobby.

16. The sixteenth part of the lesson is a listening exercise. Students are asked to listen to a short audio clip and answer questions about it.

17. The seventeenth part of the lesson is a speaking exercise. Students are asked to participate in a role-play activity.

94 What is haemolymph?

Ans Haemolymph is a fluid that fills the body cavity of invertebrates. It is composed of plasma and cells. It is responsible for the transport of nutrients, oxygen, and waste products.

95 Give four benefits of coelom of molluscs.

Ans Four benefits of coelom of molluscs are:  
1. Source of fluid for the mantle cavity.  
2. It is a fluid medium for the organs.  
3. It is a fluid medium for the body wall.  
4. It is a fluid medium for the body cavity.

96 What is a coelom?

Ans A coelom is a fluid-filled cavity that is lined by a single layer of cells. It is found in many invertebrates and vertebrates.

97 What is the 'coelom' of a mollusc? Write down its four main functions.

Ans The coelom of a mollusc is a fluid-filled cavity that is lined by a single layer of cells. Its four main functions are:  
1. It is a fluid medium for the organs.  
2. It is a fluid medium for the body wall.  
3. It is a fluid medium for the body cavity.  
4. It is a fluid medium for the mantle cavity.

98 How is the spiral shell of a mollusc different from that of a nautilus?

Ans The spiral shell of a mollusc is different from that of a nautilus in the following ways:  
1. The spiral shell is made of calcium carbonate, while the nautilus shell is made of chitin.  
2. The spiral shell is a single chamber, while the nautilus shell is a multi-chambered structure.  
3. The spiral shell is a solid structure, while the nautilus shell is a hollow structure.

99 Who are responsible for the coelom?

Ans Epithelial cells are responsible for the coelom. They are the cells that line the coelom and are responsible for its formation and maintenance.

100 Name any two beneficial insects.

Ans Two beneficial insects are:  
1. Ladybugs  
2. Bees

101 What are pseudoscolopendras and rhyngodites?

Ans Pseudoscolopendras are the appendages that are found between the segments of the body of a centipede. Rhyngodites are the segments of the body of a centipede.

Example: Scolopendras are found in the head of a centipede.

Example: Rhyngodites are found in the body of a centipede.

102 Name any two larvae found in Echinodermata.

Ans Two larvae found in Echinodermata are:  
1. Trochophore  
2. Veliger

Example: Trochophore is found in the head of a mollusc.

Example: Veliger is found in the body of a mollusc.

1. What is the main function of the cell membrane?
2. What is the function of the nucleus?
3. What is the function of the mitochondria?
4. What is the function of the chloroplast?
5. What is the function of the vacuole?
6. What is the function of the lysosome?
7. What is the function of the Golgi apparatus?
8. What is the function of the endoplasmic reticulum?
9. What is the function of the plasma membrane?
10. What is the function of the cell wall?
11. What is the function of the cell membrane?
12. What is the function of the nucleus?
13. What is the function of the mitochondria?
14. What is the function of the chloroplast?
15. What is the function of the vacuole?
16. What is the function of the lysosome?
17. What is the function of the Golgi apparatus?
18. What is the function of the endoplasmic reticulum?
19. What is the function of the plasma membrane?
20. What is the function of the cell wall?

**ESSAY TYPE QUESTIONS**

1. Describe the structure and function of the cell membrane.

\*\*\*



16      p   q   r   s      t   u   v   w   x   y   z  
 d   e   f   g   h   i   j   k   l   m   n   o   p   q   r   s   t   u   v   w   x   y   z  
 v  
 III  
 p   q   r   s   t   u   v   w   x   y   z  
 d   e   f   g   h   i   j   k   l   m   n   o   p   q   r   s   t   u   v   w   x   y   z

Таблица 4. Показатели качества жизни в зависимости от пола и возраста

10.  $\frac{1}{2} \log \frac{1}{2} = -\frac{1}{2} \log 2 = -\frac{1}{2} \times 0.3010 = -0.1505$

$$f(x) = \frac{1}{2} \left( \frac{1}{x} + \frac{1}{x+1} \right) = \frac{1}{2} \left( \frac{1}{x} + \frac{1}{x+1} \right) = \frac{1}{2} \left( \frac{1}{x} + \frac{1}{x+1} \right)$$
[illegible]

10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846.

7.  $\frac{1}{x^2} = x^{-2}$ . Then  $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$ .

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by the same author. For details, see the book by the same author.

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7. *Intervista* (interview) conducted by the author with the director of the National Institute of Statistics, 1997.

17.  $\frac{1}{2} \ln 2$

Figure 1. The effect of the concentration of the solution on the adsorption of the dye. The concentration of the solution was 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 15.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100.0, 150.0, 200.0, 300.0, 400.0, 500.0, 600.0, 700.0, 800.0, 900.0, 1000.0, 1500.0, 2000.0, 3000.0, 4000.0, 5000.0, 6000.0, 7000.0, 8000.0, 9000.0, 10000.0, 15000.0, 20000.0, 30000.0, 40000.0, 50000.0, 60000.0, 70000.0, 80000.0, 90000.0, 100000.0, 150000.0, 200000.0, 300000.0, 400000.0, 500000.0, 600000.0, 700000.0, 800000.0, 900000.0, 1000000.0, 1500000.0, 2000000.0, 3000000.0, 4000000.0, 5000000.0, 6000000.0, 7000000.0, 8000000.0, 9000000.0, 10000000.0, 15000000.0, 20000000.0, 30000000.0, 40000000.0, 50000000.0, 60000000.0, 70000000.0, 80000000.0, 90000000.0, 100000000.0, 150000000.0, 200000000.0, 300000000.0, 400000000.0, 500000000.0, 600000000.0, 700000000.0, 800000000.0, 900000000.0, 1000000000.0, 1500000000.0, 2000000000.0, 3000000000.0, 4000000000.0, 5000000000.0, 6000000000.0, 7000000000.0, 8000000000.0, 9000000000.0, 10000000000.0, 15000000000.0, 20000000000.0, 30000000000.0, 40000000000.0, 50000000000.0, 60000000000.0, 70000000000.0, 80000000000.0, 90000000000.0, 100000000000.0, 150000000000.0, 200000000000.0, 300000000000.0, 400000000000.0, 500000000000.0, 600000000000.0, 700000000000.0, 800000000000.0, 900000000000.0, 1000000000000.0, 1500000000000.0, 2000000000000.0, 3000000000000.0, 4000000000000.0, 5000000000000.0, 6000000000000.0, 7000000000000.0, 8000000000000.0, 9000000000000.0, 10000000000000.0, 15000000000000.0, 20000000000000.0, 30000000000000.0, 40000000000000.0, 50000000000000.0, 60000000000000.0, 70000000000000.0, 80000000000000.0, 90000000000000.0, 100000000000000.0, 150000000000000.0, 200000000000000.0, 300000000000000.0, 400000000000000.0, 500000000000000.0, 600000000000000.0, 700000000000000.0, 800000000000000.0, 900000000000000.0, 1000000000000000.0, 1500000000000000.0, 2000000000000000.0, 3000000000000000.0, 4000000000000000.0, 5000000000000000.0, 6000000000000000.0, 7000000000000000.0, 8000000000000000.0, 9000000000000000.0, 10000000000000000.0, 15000000000000000.0, 20000000000000000.0, 30000000000000000.0, 40000000000000000.0, 50000000000000000.0, 60000000000000000.0, 70000000000000000.0, 80000000000000000.0, 90000000000000000.0, 100000000000000000.0, 150000000000000000.0, 200000000000000000.0, 300000000000000000.0, 400000000000000000.0, 500000000000000000.0, 600000000000000000.0, 700000000000000000.0, 800000000000000000.0, 900000000000000000.0, 1000000000000000000.0, 1500000000000000000.0, 2000000000000000000.0, 3000000000000000000.0, 4000000000000000000.0, 5000000000000000000.0, 6000000000000000000.0, 7000000000000000000.0, 8000000000000000000.0, 9000000000000000000.0, 10000000000000000000.0, 15000000000000000000.0, 20000000000000000000.0, 30000000000000000000.0, 40000000000000000000.0, 50000000000000000000.0, 60000000000000000000.0, 70000000000000000000.0, 80000000000000000000.0, 90000000000000000000.0, 100000000000000000000.0, 150000000000000000000.0, 200000000000000000000.0, 300000000000000000000.0, 400000000000000000000.0, 500000000000000000000.0, 600000000000000000000.0, 700000000000000000000.0, 800000000000000000000.0, 900000000000000000000.0, 1000000000000000000000.0, 1500000000000000000000.0, 2000000000000000000000.0, 3000000000000000000000.0, 4000000000000000000000.0, 5000000000000000000000.0, 6000000000000000000000.0, 7000000000000000000000.0, 8000000000000000000000.0, 9000000000000000000000.0, 10000000000000000000000.0, 15000000000000000000000.0, 20000000000000000000000.0, 30000000000000000000000.0, 40000000000000000000000.0, 50000000000000000000000.0, 60000000000000000000000.0, 70000000000000000000000.0, 80000000000000000000000.0, 90000000000000000000000.0, 100000000000000000000000.0, 150000000000000000000000.0, 200000000000000000000000.0, 300000000000000000000000.0, 400000000000000000000000.0, 500000000000000000000000.0, 600000000000000000000000.0, 700000000000000000000000.0, 800000000000000000000000.0, 900000000000000000000000.0, 10000000

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

3.  $x^2 + 2x + 1 = (x+1)^2$   $\therefore x^2 + 2x + 1 = 0 \Rightarrow (x+1)^2 = 0 \Rightarrow x+1 = 0 \Rightarrow x = -1$

1. The water splitting up of photosynthesis that releases oxygen is called  
 A. Photorespiration B. Photolysis  
 C. Photolysis D. Photorespiration
2. The breaking of terminal phosphate of ATP releases about 7.3 kcal of  
 A. Heat B. Energy  
 C. Light D. Sound
3. Photosynthetic pigments arranged in clusters are called  
 A. Photosystems B. Photosystems  
 C. Photosystems D. Photosystems
4. During respiration, chain 2 ubiquinone (Q) is oxidized by  
 A. Ubiquinol B. Ubiquinol  
 C. Ubiquinol D. Ubiquinol
5. The final product of glycolysis is  
 A. Pyruvate B. Pyruvate  
 C. Pyruvate D. Pyruvate
6. The first action spectrum was obtained by  
 A. Engelmann B. Engelmann  
 C. Engelmann D. Engelmann
7. Conversion of one photosynthetic acid (one acetyl CoA) gives off one molecule of  
 A. CO<sub>2</sub> B. CO<sub>2</sub>  
 C. CO<sub>2</sub> D. CO<sub>2</sub>
8. Carbon dioxide enters the leaves through  
 A. Stomata B. Stomata  
 C. Stomata D. Stomata
9. Daily rhythmic opening and closing of stomata is  
 A. Controlled by guard cells B. Controlled by guard cells  
 C. Controlled by guard cells D. Controlled by guard cells
10. The primary wavelength of light is maximum at  
 A. 680 nm B. 680 nm  
 C. 680 nm D. 680 nm
11. A great deal of energy is released during  
 A. Photosynthesis B. Photosynthesis  
 C. Photosynthesis D. Photosynthesis
12. Which one is not the phase of Calvin cycle?  
 A. Carboxylation B. Carboxylation  
 C. Carboxylation D. Carboxylation
13. A graph plotting absorption of light of different wavelengths by a pigment is called  
 A. Absorption spectrum B. Absorption spectrum  
 C. Absorption spectrum D. Absorption spectrum
14. The dark reaction for photosynthesis occurs in  
 A. Cytoplasm B. Cytoplasm  
 C. Cytoplasm D. Cytoplasm
15. In the first step of citric acid cycle acetyl CoA reacts with oxaloacetate to form  
 A. Citrate B. Citrate  
 C. Citrate D. Citrate
16. An instrument that measures the relative ability of different pigments to absorb different wave lengths of light is called  
 A. Spectrophotometer B. Spectrophotometer  
 C. Spectrophotometer D. Spectrophotometer

46. All life on earth is based on the element carbon.
47. The amount of energy present within the chemical bonds of glucose is released during aerobic respiration.
48. Pyruvic acid is produced as a result of glycolysis.
49. A respiratory chain is mediated by electron carriers.
50. The electron transport chain plays a role in generation of ATP.
51. Photosynthesis is the process of capturing light energy which is stored as chemical energy in the form of glucose.
52. Chlorophyll is the pigment which captures light energy.
53. Which is a product of photosynthesis?

**SHORT ANSWER QUESTIONS -**

- Q1. What is meant by the term photosynthesis?
- Q2. Name the raw materials required for photosynthesis.
- Q3. What do you mean by autotrophic and heterotrophic nutrition?
- Q4. Define photosynthesis.
- Q5. Define heterotrophic nutrition.
- Q6. Take any two differences between photosynthesis and respiration.
- | Photosynthesis             | Respiration                |
|----------------------------|----------------------------|
| It is an anabolic process. | It is a catabolic process. |
| It occurs in chloroplasts. | It occurs in mitochondria. |



# Photosynthesis

1. What is the overall equation for photosynthesis?

Ans:  $6CO_2 + 12H_2O \xrightarrow{\text{light}} C_6H_{12}O_6 + 6O_2 + 6H_2O$

2. What are the two main stages of photosynthesis?

Ans: Light dependent reactions and Calvin cycle

3. What is the primary electron donor in the light dependent reactions?

Ans: Water ( $H_2O$ )

4. What is the primary electron acceptor in the light dependent reactions?

Ans: NADP<sup>+</sup>

5. What is the final electron acceptor in the light dependent reactions?

Ans: NADPH

6. What is the primary electron donor in the Calvin cycle?

Ans: RuBP

7. What is the primary electron acceptor in the Calvin cycle?

Ans: 3-PGA

8. What is the final electron acceptor in the Calvin cycle?

Ans: Glucose

9. What are the main products of photosynthesis?

Ans: Glucose and Oxygen

10. What are the main reactants of photosynthesis?

Ans: Carbon Dioxide and Water

11. What is the primary source of energy for photosynthesis?

Ans: Light

12. What is the primary source of carbon for photosynthesis?

Ans: Carbon Dioxide

13. What is the primary source of hydrogen for photosynthesis?

Ans: Water

What is the purpose of the Gram stain?   
 Explain the basic principle of the Gram stain.   
 Describe the steps involved in the Gram stain procedure.   
 What are the results of a Gram stain?

What is the purpose of the acid-fast stain?   
 Explain the basic principle of the acid-fast stain.   
 Describe the steps involved in the acid-fast stain procedure.

What is the purpose of the endospore stain?   
 Explain the basic principle of the endospore stain.   
 Describe the steps involved in the endospore stain procedure.   
 What is the difference between a sporophore and a sporangium?   
 What is the difference between a sporangium and a sporangiospore?   
 What is the difference between a sporangiospore and a zoospore?

What are accessory pigments in photosynthesis?   
 Explain the function of accessory pigments.   
 What is the function of the light-harvesting complex?   
 What is the function of the reaction center?   
 What is the function of the electron transport chain?   
 What is the function of the Calvin cycle?

What is the process called that is used to separate the components of a mixture?   
 Explain the process of separation.

What is the purpose of the following experiment?   
 Explain the results of the experiment.

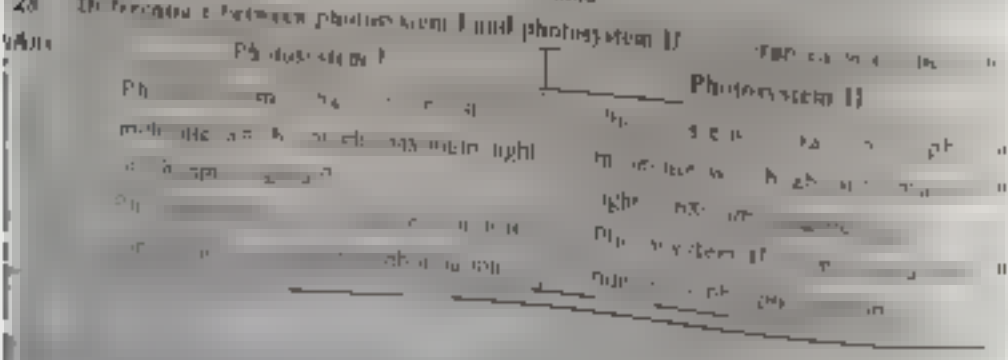
What are the results of the following experiment?   
 Explain the results of the experiment.

What are the results of the following experiment?   
 Explain the results of the experiment.

What are the results of the following experiment?   
 Explain the results of the experiment.

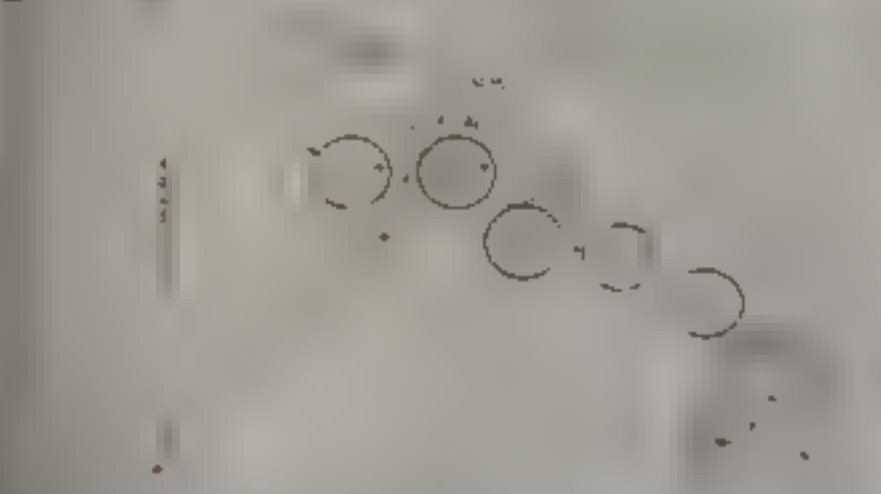
What are the results of the following experiment?   
 Explain the results of the experiment.

- Standard      Paper      100      0      100      100
1. The function of chloroplast is to convert light energy into chemical energy in the form of glucose.
  2. The process of photosynthesis is carried out in the chloroplasts of green plants.
  3. The light dependent reaction of photosynthesis takes place in the thylakoid membrane.
  4. The light dependent reaction of photosynthesis produces ATP and NADPH.
  5. The light dependent reaction of photosynthesis produces oxygen as a byproduct.
  6. The light dependent reaction of photosynthesis is an endothermic reaction.
  7. The light dependent reaction of photosynthesis is a cyclic reaction.
  8. The light dependent reaction of photosynthesis is a non-cyclic reaction.
  9. The light dependent reaction of photosynthesis is a linear reaction.
  10. The light dependent reaction of photosynthesis is a branched reaction.
  11. The light dependent reaction of photosynthesis is a complex reaction.
  12. The light dependent reaction of photosynthesis is a multi-step reaction.
  13. The light dependent reaction of photosynthesis is a highly efficient reaction.
  14. The light dependent reaction of photosynthesis is a highly specific reaction.
  15. The light dependent reaction of photosynthesis is a highly regulated reaction.
  16. The light dependent reaction of photosynthesis is a highly sensitive reaction.
  17. The light dependent reaction of photosynthesis is a highly adaptable reaction.
  18. The light dependent reaction of photosynthesis is a highly flexible reaction.
  19. The light dependent reaction of photosynthesis is a highly robust reaction.
  20. The light dependent reaction of photosynthesis is a highly resilient reaction.
  21. The light dependent reaction of photosynthesis is a highly durable reaction.
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  99. The light dependent reaction of photosynthesis is a highly worshipped reaction.
  100. The light dependent reaction of photosynthesis is a highly revered reaction.



# Handwritten title at the top of the page, possibly "Biology" or "Chemistry".

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Q1. Define photosynthesis. In which part of the plant does it take place?

Ans. Photosynthesis is the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally occurs in the mesophyll cells of the leaves. The process takes place in the chloroplasts of the plant cells.

Q2. Write down the names of main phases of photosynthesis.

Ans. The main phases of photosynthesis are:

- 1. Light reaction
  - 2. Dark reaction
- Q3. Define chemosynthesis.
- Ans. Chemosynthesis is the process by which certain bacteria synthesize organic compounds from inorganic carbon sources using chemical energy instead of light energy.
- Q4. Give function of NADP+ in photosynthesis.
- Ans. The function of NADP+ is to accept electrons and protons during the light reaction of photosynthesis, forming NADPH.
- Q5. Name the most common fuel used by the cells to provide energy for cellular respiration.
- Ans. The most common fuel used by the cells is glucose.

Q6. Differentiate between chemosynthesis and aerobic respiration with reactions.

| Chemosynthesis  | Aerobic Respiration  |
|---|--|
| <p>It is the process by which certain bacteria synthesize organic compounds from inorganic carbon sources using chemical energy.</p> <p>Example: <math>CO_2 + H_2S + O_2 \rightarrow CH_2O + SO_4^{2-}</math></p> | <p>It is the process by which cells break down glucose in the presence of oxygen to produce energy.</p> <p>Example: <math>C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O</math></p> |

Q1 What is meant by external respiration? Q1 K 4, 11  
 Ans Exchange of gases between the atmosphere and the blood in the lungs.

Q2 What is meant by internal respiration? Q2 K 4, 11  
 Ans Exchange of gases between the blood and the tissues of the body.

Q3 What is the importance of A.P.F.? Q3 K 4, 11  
 Ans The importance of A.P.F. (Alveolar Partial Pressure of Oxygen) is that it determines the rate of diffusion of oxygen from the alveoli into the blood.

Q4 Differentiate between external and internal respiration. Q4 K 4, 11  
 Ans. 

| External Respiration   | Internal Respiration  |
|--|---|
| 1. It takes place in the lungs.  | 1. It takes place in the tissues.                                       |
| 2. It involves the exchange of gases between the atmosphere and the blood. | 2. It involves the exchange of gases between the blood and the tissues. |
| 3. It is a physical process.   | 3. It is a chemical process.  |
| 4. It is a passive process.  | 4. It is an active process.   |
| 5. It is a rapid process.  | 5. It is a slow process.  |

Q5 What is external respiration? Q5 K 4, 11  
 Ans External Respiration is the exchange of gases between the atmosphere and the blood in the lungs.

Q6 What is meant by internal respiration? Q6 K 4, 11  
 Ans Internal Respiration is the exchange of gases between the blood and the tissues of the body.

Q7 What are the components? Q7 K 4, 11  
 Ans The components of the respiratory system are the trachea, bronchi, bronchioles, and alveoli.

Q8 What is the importance of the respiratory system? Q8 K 4, 11  
 Ans The respiratory system is important because it provides the body with the oxygen it needs to survive.

94 (Date: 10/10/1971) (Page: 1) (File: 10/10/1971)

4.2.1. *Aspergillus niger* (ATCC 2641) was grown in a 250 ml Erlenmeyer flask containing 100 ml of a 1% glucose solution. The flask was incubated at 25°C for 48 hours. The culture was then harvested by centrifugation at 10,000 rpm for 10 minutes. The supernatant was removed and the pellet was washed with distilled water. The washed pellet was then resuspended in distilled water and the concentration was adjusted to 1.0 x 10<sup>8</sup> spores/ml. The spore suspension was then used for the fermentation of the substrate.

It is a very good thing that the Government has decided to take this step.

1. Portuguese was the first official language of the colony.

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 221. 2210-2211

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

[illegible]

4.1 Verify down payment of acceptable reliable company and

4.113 *Principles of Acoustics & Computer Simulation*

המחיר של המוצר יגדל, וזה יגרום לירידה בביקוש. לכן, המחיר יגדל, וזה יגרום לירידה בביקוש.

ה'תשנ"ב י"ג טבת

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

4. *Conclusions.* A series of experiments have been conducted to determine the effect of the following factors on the rate of polymerization of styrene in benzene solution:

Figure 1. The effect of the concentration of the  $\text{H}_2\text{O}_2$  solution on the amount of the released  $\text{H}_2\text{O}_2$  from the  $\text{H}_2\text{O}_2$ -loaded hydrogel. The amount of the released  $\text{H}_2\text{O}_2$  was measured by the amount of the released  $\text{H}_2\text{O}_2$  from the  $\text{H}_2\text{O}_2$ -loaded hydrogel. The amount of the released  $\text{H}_2\text{O}_2$  was measured by the amount of the released  $\text{H}_2\text{O}_2$  from the  $\text{H}_2\text{O}_2$ -loaded hydrogel.

$$d_{\text{max}} = \frac{1}{2} \left( \frac{1}{\lambda_{\text{min}}} + \frac{1}{\lambda_{\text{max}}} \right) \quad \text{and} \quad d_{\text{min}} = \frac{1}{2} \left( \frac{1}{\lambda_{\text{min}}} - \frac{1}{\lambda_{\text{max}}} \right) \quad (10)$$

the magnitude of the effect of the physical characteristics of the environment on the

where  $\alpha = 0.05$  and  $\beta = 0.10$  is governed by the equation

Potential energy

4. All processes receive a unique identifier when they are created in the system.

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1.  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

or the material used in the construction of the system are not considered, an un-

$$\varphi_{\alpha} : \Gamma \rightarrow \mathbb{R} \quad \varphi_{\alpha}(x) = \frac{1}{2} \|x - \alpha\|_2^2$$

he was a ...

6. 10. 1981

מחלקת המחקר והפיתוח

\_\_\_\_\_

\_\_\_\_\_



- Q1. What is the role of an electron complex in photosynthesis?
- Ans. Role of electron complex in photosynthesis.

Q2. What is biological oxidation?

Ans. Biological oxidation is the process in which organic compounds are oxidized to release energy.

Q3. Define absorption spectrum along with its diagram.

Ans. Absorption spectrum is the spectrum in which the absorption of light is maximum. The diagram shows a graph of relative intensity of light versus wavelength.



- Q4. Give the steps of glycolysis and TCA cycle.
- Ans. Glycolysis: 1. Glucose is converted to pyruvate. 2. Pyruvate is converted to acetyl-CoA. 3. Acetyl-CoA enters the TCA cycle.



- Q5. What is a photosystem? Name its two parts or components.
- Ans. Photosystem is a complex of proteins and pigments that absorb light energy. The two parts are Photosystem I and Photosystem II.

### ESSAY TYPE QUESTIONS

- Q1. Prove that water is a source of oxygen in photosynthesis.
- Q2. Describe water as an important reactant in photosynthesis.

- [illegible]



# Nutrition

## MULTIPLE CHOICE QUESTIONS (MCQ's)

1. The cells of the stomach lining that secrete hydrochloric acid are:
  - A. Parietal cells
  - B. Chief cells
  - C. Goblet cells
  - D. Mucous cells
2. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
3. The absorption of water and salts from the small intestine is called:
  - A. Osmosis
  - B. Diffusion
  - C. Active transport
  - D. Facilitated diffusion
4. Which of the following is not a function of the liver?
  - A. Storage of glycogen
  - B. Secretion of bile
  - C. Regulation of blood sugar
  - D. Production of insulin
5. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion
6. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
7. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion
8. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
9. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion
10. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
11. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion
12. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
13. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion
14. The process of taking food into the body is called:
  - A. Ingestion
  - B. Digestion
  - C. Absorption
  - D. Egestion
15. The process of breaking down food into simpler substances is called:
  - A. Digestion
  - B. Ingestion
  - C. Absorption
  - D. Egestion

20. Elimination of undigested material in animals is called  
A. Ingestion **III** Egestion C. Absorption D. Digestion
21. A deficiency of vitamins in organism for production of energy & synthesis of cellular material is  
A. Absorption B. Digestion **III** Excretion C. Egestion
22. The first part of small intestine is called  
A. Duodenum B. Ileum C. Jejunum **IV** Duodenum
23. The middle part of the small intestine of man is called:  
**II** Jejunum B. Ileum C. Duodenum D. Cecum
24. Tentacles is a characteristic of  
**III** Hydra B. Frog C. Amoeba D. Euglena
25. Sites of Digestion in the digestive system of man are  
A. II B. I **III** C. I D. IV
26. Salivary glands are located below the  
A. Eye B. Ear **III** Tongue D. Alveolar
27. Carbohydrate digesting enzymes are called:  
A. Lipase **III** Amylase C. Protease D. Lipase
28. Which of the following secrete pepsinogen?  
A. Mucous cells B. Parietal cells C. Endothelial **IV** Zymogen cells
29. Incomplete or imperfect digestion is called:  
A. Food poisoning B. Dysentery **III** C. Dysentery D. Fever
30. Which type of cells in human stomach secrete histamine?  
A. Mucous cells B. Parietal cells **IV** Endocrine cells
31. A plant requires Nitrogen and Sulphur for its  
A. Cell wall B. Enzyme C. Growth hormone **IV** D. Synthesis of protein
32. Gastric secretion is inhibited by  
A. Acid B. Pepsinogen C. Pancreatic juice **IV** D. Gastrin
33. Some bacteria break down the proteins of dead plants and animals and release  
A. Potassium B. Phosphorus **III** C. Nitrates D. Oxygen
34. The uptake of the dissolved food molecules from the digestive region across the membrane into the cell is called:  
A. Ingestion B. Digestion **III** C. Absorption D. Assimilation
35. Biological name of Sandew is  
A. *Duradoc mustipula* **III** B. *Regina intermedia*  
C. *Sarsimom pupura* D. *Mougeon vava*
36. Ruminants are:  
**IV** A. Herbivores B. Insectivores C. Carnivores D. Omnivores
37. The length of Jejunum is about:  
A. 7.8m B. 8m C. 4m **III** D. 4m

33. The pigment that is accumulated in blind, involuntarily hunched men is  
A. xanthine B. uric acid C. cholesterol D. melanin
34. The following is the function of the gall bladder  
A. to store bile B. to secrete bile C. to produce bile D. to absorb bile
35. Gallstones are formed in the gall bladder due to the precipitation of  
A. cholesterol B. bilirubin C. calcium D. magnesium
36. The length of the human digestive tract is about  
A. 5 m B. 10 m C. 15 m D. 20 m
37. The most important factor in the absorption of food is  
A. the rate of digestion B. the surface area of the intestine C. the amount of food D. the type of food
38. Bacteria which produce vitamin K are present in  
A. the large intestine B. the small intestine C. the stomach D. the mouth
39. Food which is not absorbed in the small intestine is  
A. cellulose B. protein C. fat D. glucose
40. One of the following is a major site of absorption in the small intestine  
A. the duodenum B. the jejunum C. the ileum D. the cecum
41. A normally distributed adult male has a body weight of about  
A. 50 kg B. 60 kg C. 70 kg D. 80 kg
42. Each villus is richly supplied with blood capillaries and vessels in the lymphatic system called  
A. lacteals B. capillaries C. arterioles D. venules
43. The villi are covered with a thin layer of  
A. mucus B. glycocalyx C. glycocalyx D. glycocalyx

### SHORT ANSWER QUESTIONS

ein die Stadt zu n. empfangen

Ans. Features of unprincipled  
hypocrites are:-

Some hatter birds down the primary of dead plants and animal and leave about these hatter birds up to the staff of the bird and some birds and to give the bird a hatter bird.

4. Dissemination Strategy and Timeline

| Meaning   | Assumptions                      |
|---|----------------------------------|
| with the same in which digestion is independent | 1. he is a man                   |
| in the same way as the other is independent     | 2. Gills are for the purpose of  |
| independent of the other is independent         | 3. From the other is independent |
| in the same way as the other is independent     | 4. The other is independent      |

# THE HISTORY OF THE UNITED STATES OF AMERICA

BY HENRY REEVE

IN THREE VOLUMES

VOLUME I

THE DISCOVERY OF AMERICA

THE FIRST SETTLEMENTS

THE GROWTH OF THE COLONIES

THE REVOLUTIONARY WAR

THE CONSTITUTION

THE UNION

THE PRESENT STATE

THE FUTURE

THE END

THE HISTORY OF THE UNITED STATES OF AMERICA

BY HENRY REEVE

IN THREE VOLUMES

VOLUME I

10. The process of food digestion starts in the

11. Food digestion takes place in the

12. What is the main function of the

13. The main function of the stomach is to

14. The main function of the small intestine is to

15. The main function of the large intestine is to

16. The main function of the rectum is to

17. The main function of the anus is to

18. The main function of the salivary gland is to

19. The main function of the pancreas is to

20. The main function of the liver is to

21. The main function of the gallbladder is to

22. The main function of the duodenum is to

23. The main function of the jejunum is to

24. The main function of the ileum is to

25. The main function of the cecum is to

26. The main function of the appendix is to

27. The main function of the sigmoid colon is to

28. The main function of the descending colon is to

29. The main function of the ascending colon is to

30. The main function of the transverse colon is to

31. The main function of the hepatic flexure is to

32. The main function of the splenic flexure is to

33. The main function of the caecum is to

34. The main function of the vermiform appendix is to

35. The main function of the sigmoid colon is to

36. The main function of the descending colon is to

37. The main function of the ascending colon is to

38. The main function of the transverse colon is to

39. The main function of the hepatic flexure is to

40. The main function of the splenic flexure is to

41. The main function of the caecum is to

42. The main function of the vermiform appendix is to

43. The main function of the sigmoid colon is to

44. The main function of the descending colon is to

45. The main function of the ascending colon is to

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22nd. I have a very good...

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25th. I have a very good...

Q. What is corpuscle and antiparallelism?

| Corpuscle  | Antiparallelism   |
|--|---|
| 1. It is a small, rounded, clear structure found in the cytoplasm of a cell. | 1. It is a property of a molecule where the two strands run in opposite directions. |
| 2. It is a small, rounded, clear structure found in the cytoplasm of a cell. | 2. It is a property of a molecule where the two strands run in opposite directions. |
| 3. It is a small, rounded, clear structure found in the cytoplasm of a cell. | 3. It is a property of a molecule where the two strands run in opposite directions. |
| 4. It is a small, rounded, clear structure found in the cytoplasm of a cell. | 4. It is a property of a molecule where the two strands run in opposite directions. |
| 5. It is a small, rounded, clear structure found in the cytoplasm of a cell. | 5. It is a property of a molecule where the two strands run in opposite directions. |

Q. What is budgeting?

Ans. Budgeting is the process of allocating resources to different projects or departments. It involves estimating the costs and benefits of different options and choosing the best one. Budgeting is a key part of financial management and helps organizations to plan for the future.

Q. Define digestion.

Ans. Digestion is the process of breaking down food into smaller molecules that can be absorbed by the body. It involves the mechanical and chemical breakdown of food into its constituent parts.

Q. Write down the location of stomach.

Ans. The stomach is located in the upper left part of the abdomen, just below the diaphragm.

Q. Differentiate between chyme and bolus.

| Chyme  | Bolus   |
|--|---|
| 1. It is a semi-solid mass of food that has been partially digested. | 1. It is a solid mass of food that has been chewed and swallowed. |
| 2. It is formed in the stomach.                                      | 2. It is formed in the mouth.                                     |
| 3. It is composed of food particles and digestive juices.            | 3. It is composed of food particles and saliva.                   |
| 4. It is moved from the stomach to the small intestine.              | 4. It is moved from the mouth to the stomach.                     |
| 5. It is a mixture of food and digestive juices.                     | 5. It is a solid mass of food.                                    |

Q. Describe the three kinds of epithelial cells.

Ans. Epithelial cells are the cells that line the surfaces of organs and tissues. They are classified into three main types: simple epithelium, stratified epithelium, and glandular epithelium. Simple epithelium consists of a single layer of cells. Stratified epithelium consists of multiple layers of cells. Glandular epithelium is specialized for the secretion of substances.

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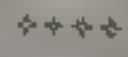
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### ESSAY TYPE QUESTIONS

- Q. 1. Discuss the various methods of digestion in plants.
- Q. 2. Describe the process of nutrition in dicot stems.
- Q. 3. Write a note on the following: (a) Photosynthesis (b) Respiration (c) Transpiration
- Q. 4. Write a note on the following: (a) Photosynthesis (b) Respiration (c) Transpiration
- Q. 5. Explain different processes involved in digestion and absorption in animals.
- Q. 6. Describe digestion in great variety of animals.
- Q. 7. Explain digestion in human animals.
- Q. 8. Describe the role of various organs in the process of digestion and absorption.
- Q. 9. Write a note on the following: (a) Photosynthesis (b) Respiration (c) Transpiration
- Q. 10. Describe the role of various organs in the process of digestion and absorption.
- Q. 11. Describe the role of various organs in the process of digestion and absorption.
- Q. 12. Describe the role of various organs in the process of digestion and absorption.
- Q. 13. Write a note on Food Processing.
- Q. 14. How do different plants meet their demands of organic compounds? Describe three methods.
- Q. 15. Explain causes and remedies of food poisoning and diabetes.
- Q. 16. Describe events that occur during the process of coagulating.



# Gaseous Exchange

## MULTIPLE CHOICE QUESTIONS (MCQs)

1. Which of the following is not a respiratory pigment?  
**A** haemoglobin **B** myoglobin **C** cytochrome c **D** transferrin
2. Which of the following is not a respiratory pigment?  
**A** haemoglobin **B** myoglobin **C** cytochrome c **D** transferrin
3. During exercise, the partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
4. The rate of diffusion of a gas is directly proportional to:  
**A** the partial pressure of the gas **B** the surface area of the membrane **C** the thickness of the membrane **D** the volume of the gas
5. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
6. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
7. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
8. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
9. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
10. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
11. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
12. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
13. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg
14. The partial pressure of oxygen in the alveoli is approximately:  
**A** 100 mmHg **B** 105 mmHg **C** 110 mmHg **D** 115 mmHg

1. The first step in the process of the formation of a new species is the isolation of a population from the rest of the population.

2. The second step is the accumulation of genetic differences between the isolated population and the rest of the population.

3. The third step is the establishment of reproductive isolation between the isolated population and the rest of the population.

4. The fourth step is the accumulation of morphological and physiological differences between the isolated population and the rest of the population.

5. The fifth step is the establishment of a new species.

6. The sixth step is the accumulation of genetic differences between the isolated population and the rest of the population.

7. The seventh step is the establishment of reproductive isolation between the isolated population and the rest of the population.

8. The eighth step is the accumulation of morphological and physiological differences between the isolated population and the rest of the population.

9. The ninth step is the establishment of a new species.

10. The tenth step is the accumulation of genetic differences between the isolated population and the rest of the population.

11. The eleventh step is the establishment of reproductive isolation between the isolated population and the rest of the population.

12. The twelfth step is the accumulation of morphological and physiological differences between the isolated population and the rest of the population.

13. The thirteenth step is the establishment of a new species.

14. The fourteenth step is the accumulation of genetic differences between the isolated population and the rest of the population.

15. The fifteenth step is the establishment of reproductive isolation between the isolated population and the rest of the population.

16. The sixteenth step is the accumulation of morphological and physiological differences between the isolated population and the rest of the population.

17. The seventeenth step is the establishment of a new species.

18. The eighteenth step is the accumulation of genetic differences between the isolated population and the rest of the population.

19. The nineteenth step is the establishment of reproductive isolation between the isolated population and the rest of the population.

20. The twentieth step is the accumulation of morphological and physiological differences between the isolated population and the rest of the population.

21. The twenty-first step is the establishment of a new species.

22. The twenty-second step is the accumulation of genetic differences between the isolated population and the rest of the population.

23. The twenty-third step is the establishment of reproductive isolation between the isolated population and the rest of the population.

1. A. In addition, many of these quicker in air than in water. (p. 100)
12. A. In addition, many of these quicker in air than in water. (p. 100)
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23. A. In addition, many of these quicker in air than in water. (p. 100)

### SHORT ANSWER QUESTIONS

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100. What is a... (p. 100)

Q1) Distinguish between the following

Q2) Distinguish between the following

1. **Parabola** is a curve that is symmetric about a vertical line. It is a U-shaped curve that opens upwards or downwards. The vertex is the point where the curve changes direction.

2. **Circle** is a closed curve that is perfectly round. It is a set of points that are all the same distance from a central point called the center. The radius is the distance from the center to the edge, and the diameter is the distance across the circle through the center.

Q3) Distinguish between parabola and ellipse

Ans: **Parabola** is a curve that is symmetric about a vertical line. It is a U-shaped curve that opens upwards or downwards. The vertex is the point where the curve changes direction. **Ellipse** is a closed curve that is elongated. It is a set of points that are all the same distance from two central points called foci. The major axis is the longest distance across the ellipse, and the minor axis is the shortest distance across the ellipse.

Q4) What is the difference between a parabola and an ellipse?

Ans: A parabola is a curve that is symmetric about a vertical line. It is a U-shaped curve that opens upwards or downwards. The vertex is the point where the curve changes direction. An ellipse is a closed curve that is elongated. It is a set of points that are all the same distance from two central points called foci.

Q5) Solve the difference between a parabola and an ellipse

Ans: **Parabola** is a curve that is symmetric about a vertical line. It is a U-shaped curve that opens upwards or downwards. The vertex is the point where the curve changes direction. **Ellipse** is a closed curve that is elongated. It is a set of points that are all the same distance from two central points called foci.

Q6) Define Parabola and Ellipse

Ans: **Parabola** is a curve that is symmetric about a vertical line. It is a U-shaped curve that opens upwards or downwards. The vertex is the point where the curve changes direction. **Ellipse** is a closed curve that is elongated. It is a set of points that are all the same distance from two central points called foci.

Q7) Name different parts of air passage way of man

Ans: **Parts of air passage way of man**  
Nose, Mouth, Throat, Larynx, Trachea, Bronchi, Lungs.

1. The following table shows the results of an experiment to determine the effect of temperature on the rate of photosynthesis in a pondweed. The table is divided into two parts: (a) and (b). The results are given in terms of the volume of gas produced in a given time.

| (a)              |   | (b)              |   |
|------------------|---|------------------|---|
| Temperature (°C) | Volume of gas produced (cm <sup>3</sup> ) | Temperature (°C) | Volume of gas produced (cm <sup>3</sup> ) |
| 10               | 1.0                                       | 20               | 2.0                                       |
| 20               | 2.0                                       | 30               | 3.0                                       |
| 30               | 3.0                                       | 40               | 4.0                                       |
| 40               | 4.0                                       | 50               | 5.0                                       |

2. The following table shows the results of an experiment to determine the effect of light intensity on the rate of photosynthesis in a pondweed. The table is divided into two parts: (a) and (b). The results are given in terms of the volume of gas produced in a given time.

| (a)                   |   | (b)                   |   |
|-----------------------|---|-----------------------|---|
| Light intensity (lux) | Volume of gas produced (cm <sup>3</sup> ) | Light intensity (lux) | Volume of gas produced (cm <sup>3</sup> ) |
| 10                    | 1.0                                       | 20                    | 2.0                                       |
| 20                    | 2.0                                       | 30                    | 3.0                                       |
| 30                    | 3.0                                       | 40                    | 4.0                                       |
| 40                    | 4.0                                       | 50                    | 5.0                                       |

3. The following table shows the results of an experiment to determine the effect of carbon dioxide concentration on the rate of photosynthesis in a pondweed. The table is divided into two parts: (a) and (b). The results are given in terms of the volume of gas produced in a given time.

| (a)                                 |   | (b)                                 |   |
|-------------------------------------|---|-------------------------------------|---|
| CO <sub>2</sub> concentration (ppm) | Volume of gas produced (cm <sup>3</sup> ) | CO <sub>2</sub> concentration (ppm) | Volume of gas produced (cm <sup>3</sup> ) |
| 10                                  | 1.0                                       | 20                                  | 2.0                                       |
| 20                                  | 2.0                                       | 30                                  | 3.0                                       |
| 30                                  | 3.0                                       | 40                                  | 4.0                                       |
| 40                                  | 4.0                                       | 50                                  | 5.0                                       |

4. The following table shows the results of an experiment to determine the effect of oxygen concentration on the rate of photosynthesis in a pondweed. The table is divided into two parts: (a) and (b). The results are given in terms of the volume of gas produced in a given time.

| (a)                                |   | (b)                                |   |
|------------------------------------|---|------------------------------------|---|
| O <sub>2</sub> concentration (ppm) | Volume of gas produced (cm <sup>3</sup> ) | O <sub>2</sub> concentration (ppm) | Volume of gas produced (cm <sup>3</sup> ) |
| 10                                 | 1.0                                       | 20                                 | 2.0                                       |
| 20                                 | 2.0                                       | 30                                 | 3.0                                       |
| 30                                 | 3.0                                       | 40                                 | 4.0                                       |
| 40                                 | 4.0                                       | 50                                 | 5.0                                       |

5. The following table shows the results of an experiment to determine the effect of pH on the rate of photosynthesis in a pondweed. The table is divided into two parts: (a) and (b). The results are given in terms of the volume of gas produced in a given time.

| (a) |   | (b) |   |
|-----|---|-----|---|
| pH  | Volume of gas produced (cm <sup>3</sup> ) | pH  | Volume of gas produced (cm <sup>3</sup> ) |
| 6   | 1.0                                       | 7   | 2.0                                       |
| 7   | 2.0                                       | 8   | 3.0                                       |
| 8   | 3.0                                       | 9   | 4.0                                       |
| 9   | 4.0                                       | 10  | 5.0                                       |



What is the function of the cell membrane? The cell membrane is a phospholipid bilayer that separates the cell from its environment. It is selectively permeable, meaning it allows some substances to pass through while blocking others. It also contains proteins that facilitate the transport of molecules and ions.

What is osmosis? Osmosis is the movement of water molecules across a semipermeable membrane from an area of lower solute concentration to an area of higher solute concentration. This process is essential for maintaining the balance of water and electrolytes in cells.

What is the function of the nucleus? The nucleus is the control center of the cell, containing the cell's genetic material (DNA) and the nucleolus. It is surrounded by a nuclear envelope with nuclear pores. The nucleus directs the synthesis of proteins and the replication of DNA.

What is Mitochondria? Mitochondria are organelles that generate most of the cell's supply of adenosine triphosphate (ATP), used as a source of chemical energy. They have a double membrane and contain their own DNA.

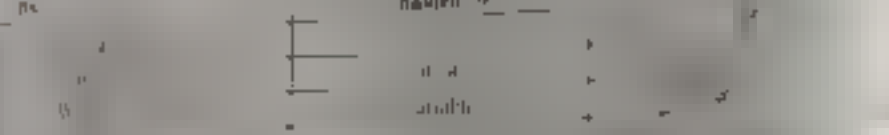
How does mitochondria differ from myoglobin?

| Mitochondria                  | Myoglobin                       |
|-------------------------------|---------------------------------|
| Contains DNA and ribosomes    | Contains only heme and globin   |
| Produces ATP                  | Stores oxygen                   |
| Found in all eukaryotic cells | Found in muscle and blood cells |

10. When the lungs are fully inflated, what is the total pressure the lungs exert?

Ans: Lung is low (atmospheric) pressure, all in all, the lungs exert a pressure of 0 mmHg.

11. Differentiate between inspiration and expiration.



12. What are the respiratory surfaces in the human body?

Ans: The respiratory surfaces are the lungs, which are covered by a moist, vascularized epithelium.

13. What is the role of the respiratory system in the human body?

Ans: The respiratory system is responsible for the exchange of gases (oxygen and carbon dioxide) between the environment and the body.

14. What is the role of the respiratory system in the human body?

Ans: The role of the respiratory system is to provide oxygen to the body and remove carbon dioxide.

15. What is the role of the respiratory system in the human body?

Ans: The role of the respiratory system is to provide oxygen to the body and remove carbon dioxide.

16. What is the role of the respiratory system in the human body?

Ans: The role of the respiratory system is to provide oxygen to the body and remove carbon dioxide.

17. What is the role of the respiratory system in the human body?

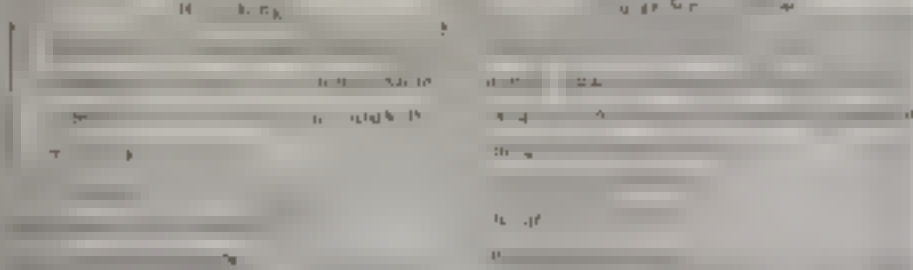
Ans: The role of the respiratory system is to provide oxygen to the body and remove carbon dioxide.



40. When gas exchange is a net loss of mass...
41. Define the relationship between the partial pressures of gases in the atmosphere and in the body fluids.
42. Describe the structure and function of the lungs.
43. Why is ventilation in water a lot more difficult than in air?
44. What are the main functions of the respiratory system?
45. Describe the structure and function of the gills.
46. Describe the structure and function of the tracheae.
47. Describe the structure and function of the book lungs.
48. Describe the structure and function of the hemolymph.
49. Describe the structure and function of the blood.
50. Describe the structure and function of the heart.
51. Describe the structure and function of the capillaries.
52. Describe the structure and function of the lymphatic system.
53. Describe the structure and function of the immune system.
54. Describe the structure and function of the nervous system.
55. Describe the structure and function of the endocrine system.
56. Describe the structure and function of the reproductive system.
57. Describe the structure and function of the digestive system.
58. Describe the structure and function of the excretory system.
59. Describe the structure and function of the integumentary system.
60. Describe the structure and function of the skeletal system.
61. Describe the structure and function of the muscular system.
62. Describe the structure and function of the circulatory system.
63. Describe the structure and function of the respiratory system.
64. Describe the structure and function of the digestive system.
65. Describe the structure and function of the excretory system.
66. Describe the structure and function of the integumentary system.
67. Describe the structure and function of the skeletal system.
68. Describe the structure and function of the muscular system.
69. Describe the structure and function of the circulatory system.
70. Describe the structure and function of the respiratory system.
71. Describe the structure and function of the digestive system.
72. Describe the structure and function of the excretory system.
73. Describe the structure and function of the integumentary system.
74. Describe the structure and function of the skeletal system.
75. Describe the structure and function of the muscular system.
76. Describe the structure and function of the circulatory system.
77. Describe the structure and function of the respiratory system.
78. Describe the structure and function of the digestive system.
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92. Describe the structure and function of the digestive system.
93. Describe the structure and function of the excretory system.
94. Describe the structure and function of the integumentary system.
95. Describe the structure and function of the skeletal system.
96. Describe the structure and function of the muscular system.
97. Describe the structure and function of the circulatory system.
98. Describe the structure and function of the respiratory system.
99. Describe the structure and function of the digestive system.
100. Describe the structure and function of the excretory system.

- Q1. Define bleaching.
- Q2. Bleaching is a process in which the color of a substance is removed or reduced.
- Q3. What is the mechanism of bleaching?
- Q4. What is the role of hydrogen peroxide in bleaching?
- Q5. What is the role of sodium hypochlorite in bleaching?
- Q6. Spectrophotometry is a technique used to measure the absorbance of a solution.
- Q7. How much absorbance is required for a solution to be considered opaque?
- Q8. Explain the relationship between absorbance and transmittance.

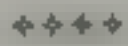
- Q9. Explain the relationship between absorbance and concentration.
- Q10. Explain the relationship between absorbance and path length.



- Q11. What are the common symptoms of photophobia?
- Q12. Explain the causes of photophobia.

**BRAIN TYPE QUESTIONS**

- Q1. Define photostress and explain its phenomenon.
- Q2. Explain negative and expressive in map.



### MULTIPLE CHOICE QUESTIONS (MCO's)

### **III**    **Prüfungsausschuss**



1. The primary function of the digestive system is to break down food into small molecules that can be absorbed by the body.

2. The process of digestion begins in the mouth, where food is mechanically broken down by chewing.

3. The chemical digestion of food begins in the stomach, where gastric juices are secreted.

4. The small intestine is the primary site for the absorption of nutrients.

5. The large intestine is responsible for the absorption of water and electrolytes.

6. The liver and pancreas are accessory organs of the digestive system.

7. The liver produces bile, which is stored in the gallbladder and released into the small intestine.

8. The pancreas secretes pancreatic juice, which is released into the small intestine.

9. The final products of digestion are absorbed into the bloodstream or the lymphatic system.

10. The digestive system is a complex organ system that plays a vital role in the body's metabolism.

11. The digestive system is composed of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus.

12. The digestive system is also known as the gastrointestinal tract.

13. The digestive system is a part of the human body that is responsible for the breakdown of food into nutrients that can be used by the body.

14. The digestive system is a complex system that involves the mechanical and chemical breakdown of food.

15. The digestive system is a part of the human body that is responsible for the absorption of nutrients from food.

16. The digestive system is a part of the human body that is responsible for the elimination of waste from the body.

17. The digestive system is a part of the human body that is responsible for the regulation of the body's fluid balance.

18. The digestive system is a part of the human body that is responsible for the regulation of the body's electrolyte balance.

19. The digestive system is a part of the human body that is responsible for the regulation of the body's pH balance.

20. The digestive system is a part of the human body that is responsible for the regulation of the body's temperature.

1. The first step is to identify the problem. This involves understanding the situation and the goals that need to be achieved.

[illegible]

1. The first part of the document is a title page. It contains the title of the document, the author's name, and the date of the document. The title is "The first part of the document is a title page." The author's name is "The author's name is the name of the person who wrote the document." The date of the document is "The date of the document is the date when the document was written." The title page is the first page of the document and it contains the title, the author's name, and the date of the document.

[illegible]

$\mu_0 = \frac{1}{\rho} \left( \frac{\partial p}{\partial \mu} \right)_{T, V}$

[illegible]

1.  $\frac{1}{2} \log \frac{1}{2} = -0.5$

$\frac{d}{dt} \left( \frac{1}{2} m v^2 + \frac{1}{2} I \omega^2 \right) = \tau \cdot \omega$

1. The first step in the process is to identify the problem. This involves gathering information about the situation and determining what needs to be solved.

[illegible][illegible]

**Affiliate**      **Product**

$\mathbb{R}^n \rightarrow \mathbb{R}^n$

11. When released

[illegible]

И. И. Мещеряков

The ad is for a new product, a "100% natural" product, and is a "100% natural" product.

Verbleef per etage op een andere manier, bijvoorbeeld in een hotel, in een appartement of in een woonruimte met een andere woonvorm.

DISCHARGE of Plaintiff from (BIBCO) caused to collect on 11/10/10

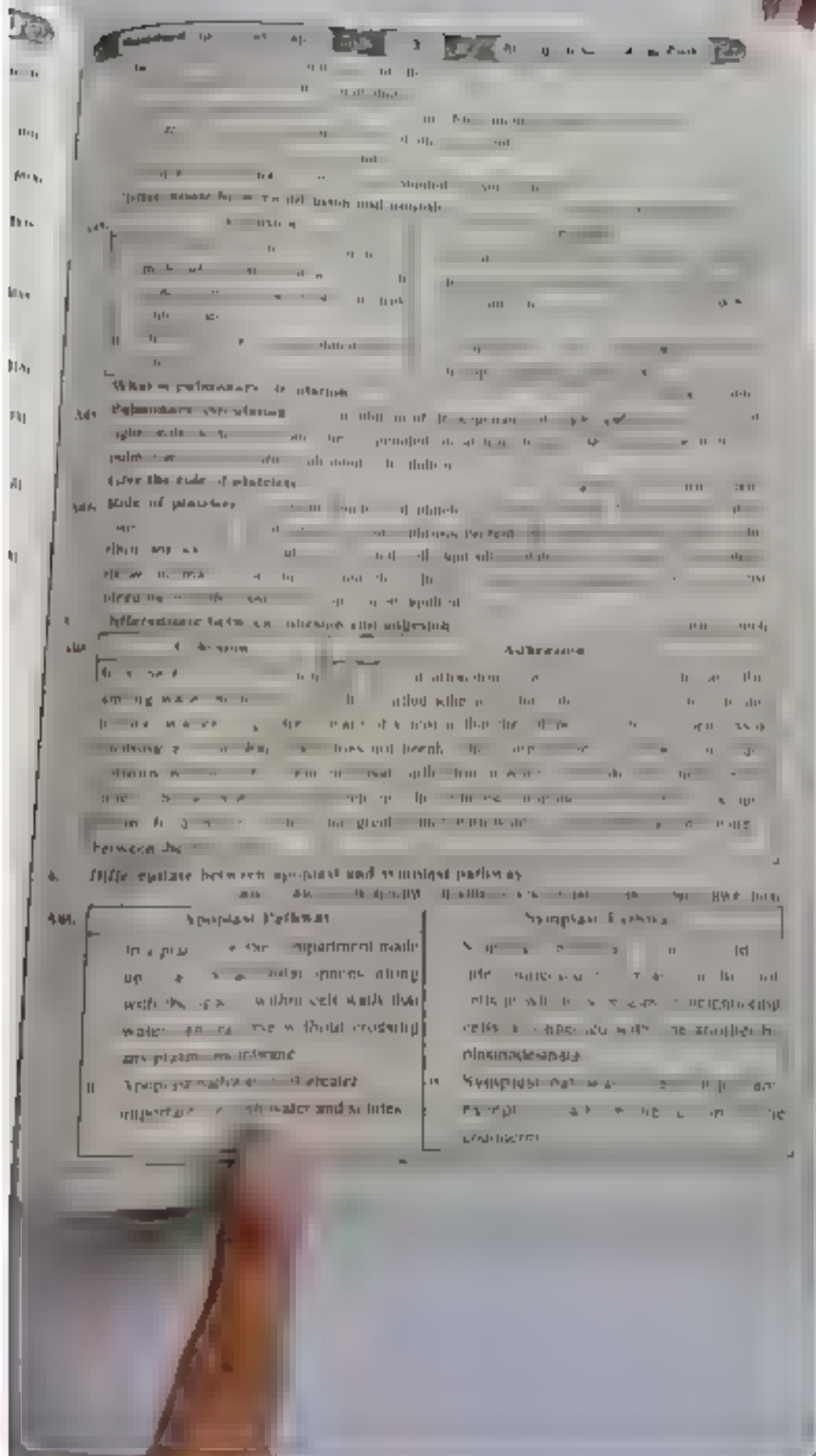
...the heart attack ...  
...the heart attack ...

[illegible]

[illegible]

### SHORT ANSWER QUESTIONS

State pressure flow theory  
Pressure flow theory is the most acceptable theory for the transport of the phloem in all plants. It was first proposed by E. M. Munch in 1938. The flow of solution in the sieve elements is driven by an osmotic pressure difference between source and sink.







Q. What is the difference between a plant and an animal cell?

A. Plant cells have a cell wall, chloroplasts and a large central vacuole. Animal cells lack these structures.

Q. How are water and ions absorbed by plants?

A. Water is absorbed by root hairs through osmosis. Ions are absorbed through active transport.

Q. How do guard cells and companion cells regulate stomatal opening?

A. Guard cells control the opening and closing of stomata. Companion cells provide support and regulate the guard cells.

Q. Name four parts of heart of fish.

A. The four parts of the heart of fish are the right atrium, right ventricle, left atrium, and left ventricle.

Q. Name four parts of heart of fish.

A. The four parts of the heart of fish are the right atrium, right ventricle, left atrium, and left ventricle.

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4. 1990 年 12 月 25 日 中国 电视 广播 集团 成立

1. *Chlorophyll a* (Chl *a*) is the primary photosynthetic pigment in most plants and algae. It is a green pigment that absorbs light energy in the blue and red regions of the visible spectrum.

...and the ... ..

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Wolfe et al. 1994

Accepted: 11 July 2006

| A | B | C | D | E | F | G | H | I | J  | K  | L  | M  | N  | O  | P  | Q  | R  | S  | T  | U  | V  | W  | X  | Y  | Z  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
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and 100% of the total sample, respectively.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

11. *Journal of the American Medical Association*, 271:1221-1225, 1994

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44. *Chrysomelidae* (Coleoptera): 16 spp. 16 figs. 16 text

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Гривенко, А. В. *См. в каталоге*

*(continued)*

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11.  $\frac{1}{2} \log_2 \frac{1}{2} = -1$

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$\mu_{\text{H}} = 1.72 \times 10^{-27} \text{ J/T}$

1. *Chlorophyll a* (Chl *a*)

*Journal of Management Education* 30(6)p. 789-801

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1.  $\frac{1}{2} \pi$  2.  $\frac{1}{2} \pi$  3.  $\frac{1}{2} \pi$  4.  $\frac{1}{2} \pi$  5.  $\frac{1}{2} \pi$  6.  $\frac{1}{2} \pi$  7.  $\frac{1}{2} \pi$  8.  $\frac{1}{2} \pi$  9.  $\frac{1}{2} \pi$  10.  $\frac{1}{2} \pi$

[illegible]

$\mu$        $q^* = 0.01$        $\mu = 0.01$        $q^* = 0.01$        $\mu = 0.01$        $q^* = 0.01$

[illegible][illegible][illegible][illegible]

1. The first step in the process of communication is the selection of a message. This is done by the sender, who chooses the information to be conveyed. The message is then encoded into a form that can be transmitted over the communication channel. This encoding process is often done using a set of rules or a code. The encoded message is then transmitted through the channel to the receiver. The receiver then decodes the message, converting it back into its original form. This decoding process is also done using a set of rules or a code. The final step in the process is the interpretation of the message by the receiver. This is done by the receiver, who understands the meaning of the message based on the context and the receiver's own knowledge and experiences.

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Handwritten text in a cursive script, likely a historical document or manuscript. The text is written in dark ink on aged, slightly discolored paper. The script is dense and fills most of the page, with some lines appearing to be underlined or separated by small gaps. The handwriting is characteristic of the 17th or 18th century. The document appears to be a letter or a formal record, given the structured nature of the lines and the use of capital letters at the beginning of some sections. The overall condition of the paper shows signs of wear, including some staining and slight discoloration at the edges.

1. Introduction

The purpose of this study is to investigate the effects of the independent variable on the dependent variable.

The study was conducted in a laboratory setting with a sample size of 30 participants.

The results of the study indicate that there is a significant positive correlation between the independent variable and the dependent variable.

The findings of this study have important implications for the field of research.

Further research is needed to explore the underlying mechanisms of the observed effects.

The study was limited by the sample size and the laboratory setting.

Despite these limitations, the study provides valuable insights into the relationship between the variables.

The study was conducted in accordance with the ethical guidelines of the research institution.

The data were analyzed using statistical software to ensure accuracy.

The results of the study are presented in the following sections.

The study was conducted in a laboratory setting with a sample size of 30 participants.

The results of the study indicate that there is a significant positive correlation between the independent variable and the dependent variable.

The findings of this study have important implications for the field of research.

Further research is needed to explore the underlying mechanisms of the observed effects.

The study was limited by the sample size and the laboratory setting.

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The study was conducted in accordance with the ethical guidelines of the research institution.

[illegible]



Q13. Describe the structure of the lymphatic system.

Q14. Explain the function of the lymphatic system.

Q15. Describe the structure of the lymphatic system.

Q16. Explain the function of the lymphatic system.

Q17. Describe the structure of the lymphatic system.

Q18. Explain the function of the lymphatic system.

Q19. Describe the structure of the lymphatic system.

Q20. Explain the function of the lymphatic system.

### ESSAY TYPE QUESTIONS

- Q1. Define lymph and describe its composition.
- Q2. Describe the structure of the lymphatic system.
- Q3. Explain the function of the lymphatic system.
- Q4. Describe the structure of the lymphatic system.
- Q5. Explain the function of the lymphatic system.
- Q6. Describe the structure of the lymphatic system.
- Q7. Explain the function of the lymphatic system.
- Q8. Describe the structure of the lymphatic system.
- Q9. Explain the function of the lymphatic system.
- Q10. Describe the structure of the lymphatic system.
- Q11. Explain the function of the lymphatic system.
- Q12. Describe the structure of the lymphatic system.
- Q13. Explain the function of the lymphatic system.
- Q14. Describe the structure of the lymphatic system.
- Q15. Explain the function of the lymphatic system.
- Q16. Describe the structure of the lymphatic system.
- Q17. Explain the function of the lymphatic system.
- Q18. Describe the structure of the lymphatic system.
- Q19. Explain the function of the lymphatic system.
- Q20. Describe the structure of the lymphatic system.



ACCORDING TO THE  
ACCELERATED LEARNING PROGRAMME  
OF EDUCATION DEPARTMENT

# ANNUAL PAPERS

TAKEN FROM PREVIOUS QUESTIONS  
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LAHORE

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$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) e^{-x^2} dx = \frac{1}{\sqrt{\pi}}$

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Special Agent in Charge

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45. 1984

# Annual Paper 2014 - 2015

1. The first part of the paper is devoted to the study of the properties of the function  $f(x)$  defined on the interval  $[0, 1]$  by the formula

$$f(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

2. The second part of the paper is devoted to the study of the properties of the function  $g(x)$  defined on the interval  $[0, 1]$  by the formula

$$g(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

$$f(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

$$g(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

$$f(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

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$$f(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

Q6 Write short answers to any 5 of the questions

(a) Write short answers to any 5 of the questions

(b) Write short answers to any 5 of the questions

(c) Write short answers to any 5 of the questions

(d) Write short answers to any 5 of the questions

(e) Write short answers to any 5 of the questions

(f) Write short answers to any 5 of the questions

(g) Write short answers to any 5 of the questions

(h) Write short answers to any 5 of the questions

(i) Write short answers to any 5 of the questions

(j) Write short answers to any 5 of the questions

(k) Write short answers to any 5 of the questions

(l) Write short answers to any 5 of the questions

## SECTION II

Note: Attempt any THREE questions

Q5 (a) Differentiate between deductive and inductive reasoning with examples

(b) Describe the two hypotheses to explain the opening and closing of stomata

Q6 (a) Discuss water as medium of life. Also give its importance

(b) Discuss taxonomic status of fungi

Q7 (a) Describe different classes of bacteria on the basis of flagella

(b) Write a note on adaptation of Bryophytes for life on land

Q8 (a) Discuss the five Kingdom system of classification proposed by Robert Whittaker

(b) Draw and describe Calvin cycle in photosynthesis

Q9 (a) Write a detailed note on Endoplasmic Reticulum

(b) Discuss the process of nutrition in insectivorous plants

Paper  
No.02

BOOK

Annual  
Paper  
2014-2019

10-10-2019

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1. The group of plants in which the vascular system is represented by a central cylinder is
- A. Gymnosperms  
B. Angiosperms  
C. Pteridophytes  
D. Bryophytes
2. The vascular tissue in plants which is responsible for the transport of water is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
3. The vascular tissue in plants which is responsible for the transport of food is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
4. The vascular tissue in plants which is responsible for the transport of water and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
5. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
6. The vascular tissue in plants which is responsible for the transport of water and food is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
7. The vascular tissue in plants which is responsible for the transport of water and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
8. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
9. The vascular tissue in plants which is responsible for the transport of water and food is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
10. The vascular tissue in plants which is responsible for the transport of water and minerals is
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B. Phloem  
C. Cambium  
D. Pith
11. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
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C. Cambium  
D. Pith
12. The vascular tissue in plants which is responsible for the transport of water and food is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
13. The vascular tissue in plants which is responsible for the transport of water and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
14. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
15. The vascular tissue in plants which is responsible for the transport of water and food is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
16. The vascular tissue in plants which is responsible for the transport of water and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
17. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
18. The vascular tissue in plants which is responsible for the transport of water and food is
- A. Xylem  
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D. Pith
19. The vascular tissue in plants which is responsible for the transport of water and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith
20. The vascular tissue in plants which is responsible for the transport of food and minerals is
- A. Xylem  
B. Phloem  
C. Cambium  
D. Pith

Full Name \_\_\_\_\_ be filled up by the candidate  
Mr. \_\_\_\_\_ SUBJECTIVE TYPE (Time allowed - 40 Hours)

SECTION I

Q2. Write short answers to any EIGHT (8) questions. 10

- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_
- (iv) \_\_\_\_\_
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- (vi) \_\_\_\_\_
- (vii) \_\_\_\_\_
- (viii) \_\_\_\_\_
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- (xvii) \_\_\_\_\_
- (xviii) \_\_\_\_\_
- (xix) \_\_\_\_\_
- (xx) \_\_\_\_\_

Q3. Write short answers to any EIGHT (8) questions. 10

- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_
- (iv) \_\_\_\_\_
- (v) \_\_\_\_\_
- (vi) \_\_\_\_\_
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- (viii) \_\_\_\_\_
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- (xiv) \_\_\_\_\_
- (xv) \_\_\_\_\_
- (xvi) \_\_\_\_\_
- (xvii) \_\_\_\_\_
- (xviii) \_\_\_\_\_
- (xix) \_\_\_\_\_
- (xx) \_\_\_\_\_

Q4 Write short answers to any SIX (6) questions

- (a) What is the difference between a hypothesis and a theory?
- (b) What is the difference between a hypothesis and a theory?
- (c) What is the difference between a hypothesis and a theory?
- (d) What is the difference between a hypothesis and a theory?
- (e) What is the difference between a hypothesis and a theory?
- (f) What is the difference between a hypothesis and a theory?
- (g) What is the difference between a hypothesis and a theory?
- (h) What is the difference between a hypothesis and a theory?
- (i) What is the difference between a hypothesis and a theory?
- (j) What is the difference between a hypothesis and a theory?

## SECTION - II

Note: Attempt any THREE questions.

3 x 5

Q5. (a) What is hypothesis? Discuss briefly the deductive and inductive reasonings.

(b) Describe the composition of blood plasma.

Q6. (a) Give importance of water in nature.

(b) How asexual reproduction occurs in fungi?

Q7. (a) Discuss the process of Nutrition in Bacteria.

(b) Describe gametophyte stage in the life history of Adiantum.

Q8. (a) Describe Life Cycle of Bacteriophages (labelled diagrams).

(b) What is Glycolysis? Sketch its various steps only.

Q9. (a) Describe the structure and functions of Chloroplast.

(b) Describe digestion in oral cavity of man.

Paper  
No. 03

**BIOLOGY**

Annual  
Paper  
2014-2019

Roll No.

Form filled up by the candidate

Subject

(OBJECTIVE TYPE)

Page No. of Questions

NOTE: On each objective type question, A, B, C and D. The choice which you think is correct. The circle is filled of that question number. One mark is given for each correct answer. If two or more circles will result in the mark as incorrect.

Q. The structure of the cell which helps in the control of water balance and osmotic pressure is called

(a) Nucleus (b) Mitochondrion (c) Golgi body (d) Centriole

Q. The age of the Earth is estimated to be

(a) 4.5 billion years (b) 4.5 million years (c) 4.5 thousand years (d) 4.5 hundred years

Q. The process of photosynthesis is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of respiration is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of transpiration is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of osmosis is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of diffusion is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of active transport is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of passive transport is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of facilitated diffusion is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of endocytosis is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

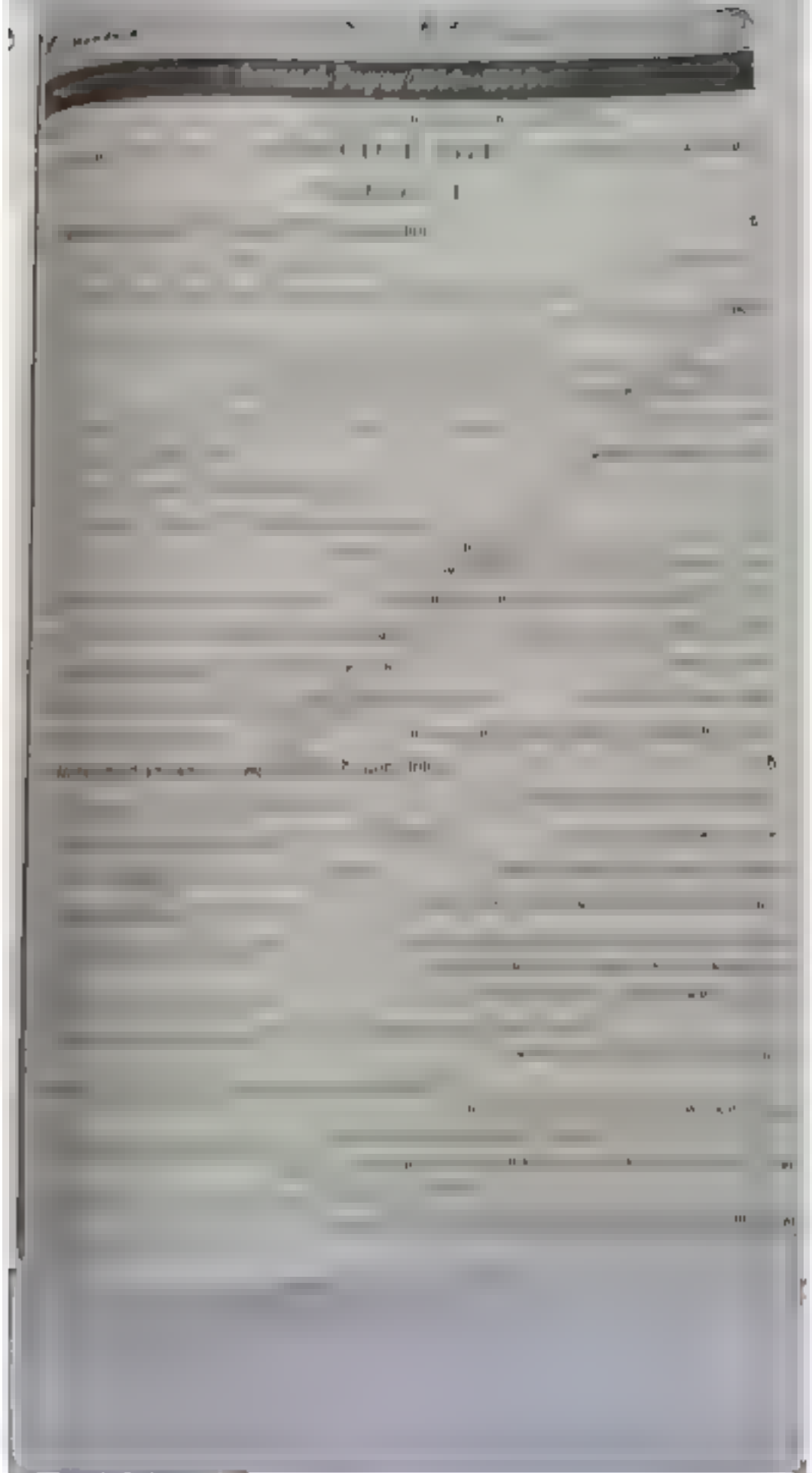
Q. The process of exocytosis is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

Q. The process of phagocytosis is called

(a) anabolic process (b) catabolic process (c) exothermic process (d) endothermic process

8. Promoters sequences are called:
  - A.  $-35$
  - B.  $-25$
  - C.  $-10$
  - D.  $-5$
9. The simplest of all biophysics are
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
10. Which one of the following is not a sub-phylum of chordata?
  - A. Cephalochordata
  - B. Vertebrata
  - C. Cephalochordata
  - D. Cephalochordata
11. All the following belong to phylum:
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
12. The first action spectrum was obtained by
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
13. The dark reaction for photosynthesis occurs in
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
14. Carbohydrate digesting enzymes are called
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
15. Which type of cells in human stomach secrete Gastrin?
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
16. Break down of alcohol of lungs is called
  - A.  $10^{-10}$
  - B.  $10^{-11}$
  - C.  $10^{-12}$
  - D.  $10^{-13}$
17. Normal pH of human blood is
  - A.  $7.35$
  - B.  $7.38$
  - C.  $7.41$
  - D.  $7.44$



Standard ... are ...  
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Q4. Write short answers to any SIX (6) questions.

- (a) ...
- (b) ...
- (c) ...
- (d) ...
- (e) ...
- (f) ...
- (g) ...
- (h) ...
- (i) ...
- (j) ...

## SECTION II

Note: Attempt any THREE questions

3 × 8 = 24

Q5. (a) Explain the biological method for solving a biological problem.

(b) Give functions of lymphatic system.

Q6. (a) What functions are performed by proteins in the bodies of living organisms?

(b) Describe and draw life cycle of *Rhizopus*.

Q7. (a) Describe different physical and chemical methods to control bacteria.

(b) Give the list of various steps involved in the evolution of seed habit?

Q8. (a) Write a note on Acquired Immune Deficiency Syndrome (AIDS).

(b) Explain kreb cycle (Give only outline of kreb cycle)

Q9. (a) Differentiate between Prokaryotic and Eukaryotic cells.

(b) Explain digestion in human stomach.

Page  
No 04

# BIOLOGY

2014-2015

Q.1

Q.2

Q.3

Q.4

Q.5

Q.6

Q.7

Q.8

Q.9

Q.10

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Q.16

Q.17

Q.18

Q.19

Q.20

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Q.22

Q.23

Q.24

Q.25

Q.26

Q.27

Q.28

Q.29

Q.30

$\frac{1}{2} \left( \frac{1}{2} + \frac{1}{2} \right) = \frac{1}{2}$

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26. Write short answers to any five of the following

- (i) Why is the cell wall of bacteria important?
- (ii) What is the function of the nucleus?
- (iii) What is the function of the mitochondria?
- (iv) What is the function of the chloroplast?
- (v) What is the function of the vacuole?
- (vi) What is the function of the lysosome?
- (vii) What is the function of the Golgi apparatus?
- (viii) What is the function of the endoplasmic reticulum?
- (ix) What is the function of the plasma membrane?
- (x) What is the function of the cell membrane?

## SECTION II

Note: Attempt any FIVE of the following

27. a) Define the following branches of Biology

- i) Microbiology
- ii) Botany
- iii) Zoology
- iv) Physiology
- v) Biochemistry

b) Describe the structure of a cell

28. a) Describe the structure and function of the following

(i) Write a note on the structure of a flower

29. a) Compare and contrast prokaryotic and eukaryotic cells on the basis of cell wall

b) Write down the life cycle of a bacterium

30. a) Define virus. Write a note on the characteristics of viruses

(b) Describe the role of water in photosynthesis

31. a) Write a note on mitochondria

(b) Describe the role of the large intestine in human digestion

Paper  
No 05

BIOLOGY

Annual  
Paper  
2014-2019

BIOMECHANICS

Q.1. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.2. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.3. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.4. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.5. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.6. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.7. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.8. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

Q.9. A person of mass 70 kg is standing on a horizontal surface. The force exerted by the ground on the person is 700 N. Calculate the normal force exerted by the ground on the person.

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1)  $\lambda_{1,2} = \frac{1}{2}(\mu_1 + \mu_2) \pm \frac{1}{2}(\mu_1 - \mu_2)$   $\mu_1 = 1, \mu_2 = 2$   $\lambda_{1,2} = \frac{1}{2}(1+2) \pm \frac{1}{2}(1-2)$   $\lambda_1 = 1.5, \lambda_2 = 0.5$   $\lambda_1 \neq \lambda_2$

The number of pairs of patches in individual segments of each reach are

<sup>a</sup>  $\chi^2(1) = 0.67$ ,  $p = .41$ ;  $\chi^2(1) = 0.89$ ,  $p = .34$ .

There is a significant difference in the number of subjects who were able to perform the task.

[illegible]

† *Excerpta* pp. 1-16, 1972, edition by the author.

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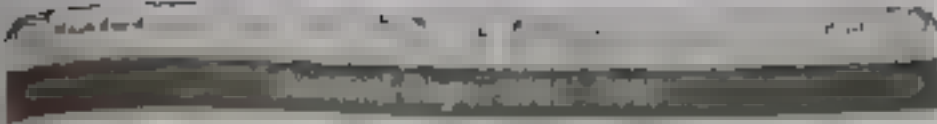
Maxwell is promised a substance he only later learns exists.

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SECTION

Write the answer to each question

Write the answer to each question

Q3 Write your answers to any SIX of questions

## SECTION II

100

Note: Answer any THREE questions

Q4 a) Differentiate between deductive and inductive reasoning with examples

b) Define community. Give its types

Q5 a) Describe primary and secondary structure of protein

b) Give an account of Ascomycetes

Q6 a) Write a note on use and misuse of antibiotics

b) Describe the life cycle of an angiospermic plant.

Q7 a) Sketch the structure, RNA of HIV

b) Draw glycolysis. Give its energy balance

Q8 a) Describe the structure and function of plasma membrane

b) Discuss Mineral and Nutrient Methods in plants

# Answers

PAPER NO. 2014

SUBJECTIVE TYPE-I

Q1. Find the value of  $x$  and  $y$ .

$$\begin{aligned} \frac{1}{x} + \frac{1}{y} &= \frac{1}{2} \\ \frac{1}{x} - \frac{1}{y} &= \frac{1}{4} \end{aligned}$$

SUBJECTIVE TYPE-II

Q2. What is the value of  $x$  and  $y$ ?

$$\begin{aligned} \frac{1}{x} + \frac{1}{y} &= \frac{1}{2} \\ \frac{1}{x} - \frac{1}{y} &= \frac{1}{4} \end{aligned}$$

Q3. What is the value of  $x$  and  $y$ ?

$$\begin{aligned} \frac{1}{x} + \frac{1}{y} &= \frac{1}{2} \\ \frac{1}{x} - \frac{1}{y} &= \frac{1}{4} \end{aligned}$$

Q4. What is the value of  $x$  and  $y$ ?

$$\begin{aligned} \frac{1}{x} + \frac{1}{y} &= \frac{1}{2} \\ \frac{1}{x} - \frac{1}{y} &= \frac{1}{4} \end{aligned}$$

Q5. What is the value of  $x$  and  $y$ ?

$$\begin{aligned} \frac{1}{x} + \frac{1}{y} &= \frac{1}{2} \\ \frac{1}{x} - \frac{1}{y} &= \frac{1}{4} \end{aligned}$$

Q.1. What are the two main types of respiration?  
 Ans. Aerobic and Anaerobic.  
 Q.2. What is aerobic respiration?  
 Ans. It is a process in which glucose is broken down in the presence of oxygen to produce carbon dioxide, water, and energy.  
 Q.3. What is anaerobic respiration?  
 Ans. It is a process in which glucose is broken down in the absence of oxygen to produce lactic acid or ethanol and energy.  
 Q.4. What is the difference between aerobic and anaerobic respiration?  
 Ans. Aerobic respiration requires oxygen and produces a large amount of energy, while anaerobic respiration does not require oxygen and produces a small amount of energy.  
 Q.5. What are the products of aerobic respiration?  
 Ans. Carbon dioxide, water, and energy.  
 Q.6. What are the products of anaerobic respiration?  
 Ans. Lactic acid or ethanol and energy.

Q.7. What is the equation for aerobic respiration?  
 Ans.  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$   
 Q.8. What is the equation for anaerobic respiration?  
 Ans.  $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2 + \text{Energy}$   
 Q.9. What are the two types of anaerobic respiration?  
 Ans. Lactic acid fermentation and alcoholic fermentation.  
 Q.10. What is lactic acid fermentation?  
 Ans. It is a process in which glucose is broken down into lactic acid and energy.  
 Q.11. What is alcoholic fermentation?  
 Ans. It is a process in which glucose is broken down into ethanol and carbon dioxide, and then ethanol is further broken down into acetaldehyde and energy.

**Q.3: Short Answer questions**

Q.1. What are the chemical symbols for their proportion in human body?  
 Ans. H<sub>2</sub>O, C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>, O<sub>2</sub>, CO<sub>2</sub>, H<sub>2</sub>, and ATP.

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1. The first part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

2. The second part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

3. The third part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

4. The fourth part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

5. The fifth part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

6. The sixth part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

7. The seventh part of the document is a list of names and addresses. The names are written in a cursive script, and the addresses are written in a more formal, printed script. The list is organized into two columns, with names on the left and addresses on the right.

Write answers to IDENTIFICATION questions

1. a. Is there a difference between the two types of...?
- b. ...?
- c. ...?
- d. ...?
- e. ...?
- f. ...?
2. a. ...?
- b. ...?
- c. ...?
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- e. ...?
- f. ...?
3. a. ...?
- b. ...?
- c. ...?
- d. ...?
- e. ...?
- f. ...?

IDENTIFICATION NO. 1

IDENTIFICATION NO. 2

1. State the following:

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IDENTIFICATION NO. 3

Section 1

1. State the following:

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20. ...

1. The first part of the paper is devoted to a general discussion of the problem.

2. In the second part, we shall consider the case of a single particle.

3. The third part is devoted to the case of a system of particles.

4. In the fourth part, we shall consider the case of a continuous medium.

5. The fifth part is devoted to the case of a system of continuous media.

6. In the sixth part, we shall consider the case of a continuous medium with internal structure.

7. The seventh part is devoted to the case of a system of continuous media with internal structure.

8. In the eighth part, we shall consider the case of a continuous medium with internal structure and external forces.

9. The ninth part is devoted to the case of a system of continuous media with internal structure and external forces.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry must be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze data. These include direct observation, interviews with key personnel, and the use of specialized software tools. Each method has its own strengths and limitations, and the choice of which to use depends on the specific requirements of the study.

The third part of the document provides a detailed description of the data collection process. It explains how data was gathered from different sources and how it was then organized into a structured format. This section also includes a discussion of the challenges encountered during the process and how they were overcome.

Finally, the document concludes with a summary of the findings and a list of recommendations for future research. The author suggests that further studies should focus on developing more efficient data collection methods and improving the accuracy of the analysis tools.

**Notes:**

- 1. All data was collected from a single source to ensure consistency.
- 2. The data was collected over a period of six months.
- 3. The data was collected from a sample of 100 participants.
- 4. The data was collected from a sample of 100 participants.
- 5. The data was collected from a sample of 100 participants.

The data was collected from a sample of 100 participants. The data was collected from a sample of 100 participants. The data was collected from a sample of 100 participants.

*[Faint, illegible handwritten notes]*

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►  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$   $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$   $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

$$\begin{aligned} & \text{Let } \mathcal{H} = \{H_1, H_2, \dots, H_n\} \text{ be a family of } n \text{ hyperplanes in } \mathbb{R}^d. \text{ Define } \mathcal{H}' = \{H'_1, H'_2, \dots, H'_n\} \text{ where } H'_i = H_i \cap H_j \text{ for } i \neq j. \\ & \text{Then } \mathcal{H}' \text{ is a family of } n \text{ hyperplanes in } \mathbb{R}^d \text{ such that } \mathcal{H}' \cap \mathcal{H} = \emptyset. \end{aligned}$$

|   |   |   |      |     |       |       |      |       |    |    |    |   |
|---|---|---|------|-----|-------|-------|------|-------|----|----|----|---|
| P | m | • | 0.01 | 0.4 | 11.7% | 17.11 | 12.7 | 10.11 | 11 | 11 | 10 | 9 |
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$$\begin{aligned} \mathbf{M}_{\text{eff}} &= \mathbf{M} \left( \mathbf{I} - \mathbf{M}^{-1} \mathbf{M}_{\text{eff}} \right)^{-1} \mathbf{M} \\ \mathbf{M}_{\text{eff}} &= \mathbf{M} \left( \mathbf{I} - \mathbf{M}^{-1} \mathbf{M}_{\text{eff}} \right)^{-1} \mathbf{M} \end{aligned}$$

$\beta = \frac{1}{1 + \frac{1}{\alpha}}$ 
 $\frac{1}{\alpha} = \frac{1}{\beta} - 1$ 
 $\alpha = \frac{\beta}{\beta - 1}$ 
 $\alpha = \frac{1}{1 - \beta}$

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$\Gamma_k = \begin{cases} \alpha_k \beta_k \gamma_k & \text{if } k \text{ is odd} \\ \alpha_k \beta_k \gamma_k & \text{if } k \text{ is even} \end{cases}$

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When competition is high, the rate of feeding decreases. This is because the animals are inhibited from feeding by the presence of other animals. This is an example of negative feedback.

Q. What is the role of the hypothalamus in feeding?   
 Ans. The hypothalamus is a part of the brain that controls many of the body's functions, including feeding. It receives signals from the stomach and the intestines and sends signals to the muscles and the digestive system to start feeding.

Q. What is the role of the hypothalamus in hunger?   
 Ans. The hypothalamus is a part of the brain that controls many of the body's functions, including hunger. It receives signals from the stomach and the intestines and sends signals to the muscles and the digestive system to start eating.

Q. Why are hunger signals called death signals?   
 Ans. Hunger signals are called death signals because they indicate that the body is in a state of emergency. If the body does not receive enough food, it will die.

Q. What do you mean by budding and parthenogenesis?   
 Ans. Budding is a form of asexual reproduction in which a new individual grows out of the side of the parent. Parthenogenesis is a form of asexual reproduction in which a new individual develops from an unfertilized egg.

Q. What are the harmful effects of insects?   
 Ans. Insects can cause a lot of damage to crops and to the environment. They can eat the leaves and the roots of plants, and they can spread diseases.

1. Many species of insects are pests that damage crops and the environment.
2. Some species of insects cause diseases in humans and animals.
3. A number of insects, as eggs or larvae, damage commercial crops such as wheat, maize, cotton and sugarcane etc. The larvae of these insects damage the crops resulting in economic loss to farmers, e.g. locusts.

Q. Give three basic characteristics of chordates.

Ans. Basic characteristics of chordates: All chordates possess three basic characteristics as follows:   
 1. All chordates possess the notochord.   
 2. All chordates have a central nervous system that is dorsal in position and is hollow.   
 3. All chordates develop paired gill openings in embryonic stage.

Q. What are hemocytes? Give their function.

Ans. Hemocytes are the stinging cells embedded in tentacles and are derived from endodermis.

# Function of the plant cell

- i. To provide structural support
- ii. To store food and water
- iii. To perform photosynthesis
- iv. To transport substances

Q. Define photosynthesis.

Ans. The process by which green plants use sunlight to synthesize food from carbon dioxide and water.

Q. What is the raw material for photosynthesis?

Ans. The raw materials for photosynthesis are carbon dioxide and water.

## Short answers que. 1000

i. Define photosynthesis.

Ans. The process by which green plants use sunlight to synthesize food from carbon dioxide and water.

ii. What is the raw material for photosynthesis?

Ans. The raw materials for photosynthesis are carbon dioxide and water.

iii. Give important functions of chloroplast.

## Functions of Chloroplast

The chloroplast is a green organelle found in plant cells.

i. It is the site of photosynthesis.

A variety of pigments are present in the chloroplast which absorb light energy.

ii. Define polysaccharide and monomer.

Ans. Polysaccharide is a long chain of monomers.

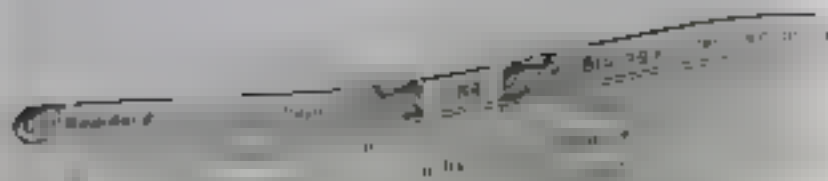
Monomer is a single unit of a polymer.

Each monomer is a sugar molecule.

Monomers are joined together by glycosidic bonds.

iii. How does the leaf transport water?

Ans. Water is transported through the xylem vessels. The xylem is a part of the vascular bundle. It consists of long, thin, tube-like structures. Water moves from the roots to the leaves through the xylem.



Q1) Define meristem. How is it classified?  
 Ans) Meristem is a region of undifferentiated cells in a plant that is capable of cell division. It is classified into three types: Apical meristem, Lateral meristem, and Intercalary meristem.

Q2) What are the different types of meristems and their functions?  
 Ans) There are three types of meristems: Apical meristem, Lateral meristem, and Intercalary meristem. Apical meristem is responsible for the growth of the plant in length. Lateral meristem is responsible for the growth of the plant in width. Intercalary meristem is responsible for the growth of the plant in girth.

Q3) Differentiate between homioisotem and poikilotherm.  
 Ans) Homioisotem is a term used to describe an organism that maintains a constant body temperature. Poikilotherm is a term used to describe an organism that cannot maintain a constant body temperature and its body temperature varies with the environment.

Q4) Define flower. What are essential and non-essential parts of flower?  
 Ans) Flower is a reproductive structure of a plant. Essential parts of flower are those parts that are necessary for the reproduction of the plant. Non-essential parts of flower are those parts that are not necessary for the reproduction of the plant.

Q5) Differentiate between single and double circulate heart.  
 Ans) Single circulate heart is a type of heart in which the blood flows in a single circuit. Double circulate heart is a type of heart in which the blood flows in two circuits.

| Single Circulate Heart  | Double Circulate Heart   |
|---|--|
| 1. Single circulate heart is found in fish, amphibians, and reptiles. | 1. Double circulate heart is found in birds and mammals.       |
| 2. In single circulate heart, the blood flows in a single circuit.    | 2. In double circulate heart, the blood flows in two circuits. |
| 3. Example: The heart of a fish is a single circulate heart.          | 3. Example: The heart of a mammal is a double circulate heart. |

Q6) Define blue babies and its cause.  
 Ans) Blue babies are babies who have a condition called cyanosis, which causes their skin to turn blue. This is caused by a lack of oxygen in the blood.

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### SECTION - II

Note: Attempt any 10 out of 12 questions

- Q15. (a) Explain the significance of method for solving a biological problem.  
(b) Give functions of lymphatic system.
- Q16. (a) What factors are responsible for protein in the body of an organism?  
(b) Describe and draw the cycle of Rheumatoid.
- Q17. (a) Describe different physical and chemical methods to synthesize protein.  
(b) Give the list of various steps involved in the evolution of life on earth.
- Q18. (a) Write a note on Acquired Immune Deficiency Syndrome (AIDS).  
(b) Explain Krebs cycle (give only outline of Krebs cycle).
- Q19. (a) Differentiate between Prokaryotic and Eukaryotic cells.  
(b) Explain digestion in human stomach.

**-- PAPER NO. 4 --**

**-- OBJECTIVE TYPE --**

**U.P. Multiple choice questions**

|                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. Name the following | 2. Name the following | 3. Name the following | 4. Name the following |
| 5. Name the following | 6. Name the following | 7. Name the following | 8. Name the following |

## 11 2114

$$d_1 = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} e^{-t^2} dt = \frac{1}{\sqrt{\pi}} \cdot \sqrt{\pi} = 1$$

$\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & i \\ 0 & 1 \end{pmatrix}$

Figure 1. The effect of the initial concentration of the monomer on the polymerization of *l*-lysine.

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decreasing the demand on the system, the model is still best as before.

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q d n p l e s q t m e p f s i q s c d

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It is not clear whether the above results are due to the fact that the model is not a true random walk, or whether they are due to the fact that the model is not a true random walk.

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*Journal of Management Education* 30(6)p. 789-804

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| $1_1$ | $1_2$ | $2_1$ | $1_3$ | $1_4$ | $1_5$ | $1_6$ | $1_7$ | $1_8$ | $1_9$ | $1_{10}$ | $1_{11}$ | $1_{12}$ | $1_{13}$ | $1_{14}$ | $1_{15}$ | $1_{16}$ | $1_{17}$ | $1_{18}$ | $1_{19}$ | $1_{20}$ | $1_{21}$ | $1_{22}$ | $1_{23}$ | $1_{24}$ | $1_{25}$ | $1_{26}$ | $1_{27}$ | $1_{28}$ | $1_{29}$ | $1_{30}$ | $1_{31}$ | $1_{32}$ | $1_{33}$ | $1_{34}$ | $1_{35}$ | $1_{36}$ | $1_{37}$ | $1_{38}$ | $1_{39}$ | $1_{40}$ | $1_{41}$ | $1_{42}$ | $1_{43}$ | $1_{44}$ | $1_{45}$ | $1_{46}$ | $1_{47}$ | $1_{48}$ | $1_{49}$ | $1_{50}$ | $1_{51}$ | $1_{52}$ | $1_{53}$ | $1_{54}$ | $1_{55}$ | $1_{56}$ | $1_{57}$ | $1_{58}$ | $1_{59}$ | $1_{60}$ | $1_{61}$ | $1_{62}$ | $1_{63}$ | $1_{64}$ | $1_{65}$ | $1_{66}$ | $1_{67}$ | $1_{68}$ | $1_{69}$ | $1_{70}$ | $1_{71}$ | $1_{72}$ | $1_{73}$ | $1_{74}$ | $1_{75}$ | $1_{76}$ | $1_{77}$ | $1_{78}$ | $1_{79}$ | $1_{80}$ | $1_{81}$ | $1_{82}$ | $1_{83}$ | $1_{84}$ | $1_{85}$ | $1_{86}$ | $1_{87}$ | $1_{88}$ | $1_{89}$ | $1_{90}$ | $1_{91}$ | $1_{92}$ | $1_{93}$ | $1_{94}$ | $1_{95}$ | $1_{96}$ | $1_{97}$ | $1_{98}$ | $1_{99}$ | $1_{100}$ | $1_{101}$ | $1_{102}$ | $1_{103}$ | $1_{104}$ | $1_{105}$ | $1_{106}$ | $1_{107}$ | $1_{108}$ | $1_{109}$ | $1_{110}$ | $1_{111}$ | $1_{112}$ | $1_{113}$ | $1_{114}$ | $1_{115}$ | $1_{116}$ | $1_{117}$ | $1_{118}$ | $1_{119}$ | $1_{120}$ | $1_{121}$ | $1_{122}$ | $1_{123}$ | $1_{124}$ | $1_{125}$ | $1_{126}$ | $1_{127}$ | $1_{128}$ | $1_{129}$ | $1_{130}$ | $1_{131}$ | $1_{132}$ | $1_{133}$ | $1_{134}$ | $1_{135}$ | $1_{136}$ | $1_{137}$ | $1_{138}$ | $1_{139}$ | $1_{140}$ | $1_{141}$ | $1_{142}$ | $1_{143}$ | $1_{144}$ | $1_{145}$ | $1_{146}$ | $1_{147}$ | $1_{148}$ | $1_{149}$ | $1_{150}$ | $1_{151}$ | $1_{152}$ | $1_{153}$ | $1_{154}$ | $1_{155}$ | $1_{156}$ | $1_{157}$ | $1_{158}$ | $1_{159}$ | $1_{160}$ | $1_{161}$ | $1_{162}$ | $1_{163}$ | $1_{164}$ | $1_{165}$ | $1_{166}$ | $1_{167}$ | $1_{168}$ | $1_{169}$ | $1_{170}$ | $1_{171}$ | $1_{172}$ | $1_{173}$ | $1_{174}$ | $1_{175}$ | $1_{176}$ | $1_{177}$ | $1_{178}$ | $1_{179}$ | $1_{180}$ | $1_{181}$ | $1_{182}$ | $1_{183}$ | $1_{184}$ | $1_{185}$ | $1_{186}$ | $1_{187}$ | $1_{188}$ | $1_{189}$ | $1_{190}$ | $1_{191}$ | $1_{192}$ | $1_{193}$ | $1_{194}$ | $1_{195}$ | $1_{196}$ | $1_{197}$ | $1_{198}$ | $1_{199}$ | $1_{200}$ | $1_{201}$ | $1_{202}$ | $1_{203}$ | $1_{204}$ | $1_{205}$ | $1_{206}$ | $1_{207}$ | $1_{208}$ | $1_{209}$ | $1_{210}$ | $1_{211}$ | $1_{212}$ | $1_{213}$ | $1_{214}$ | $1_{215}$ | $1_{216}$ | $1_{217}$ | $1_{218}$ | $1_{219}$ | $1_{220}$ | $1_{221}$ | $1_{222}$ | $1_{223}$ | $1_{224}$ | $1_{225}$ | $1_{226}$ | $1_{227}$ | $1_{228}$ | $1_{229}$ | $1_{230}$ | $1_{231}$ | $1_{232}$ | $1_{233}$ | $1_{234}$ | $1_{235}$ | $1_{236}$ | $1_{237}$ | $1_{238}$ | $1_{239}$ | $1_{240}$ | $1_{241}$ | $1_{242}$ | $1_{243}$ | $1_{244}$ | $1_{245}$ | $1_{246}$ | $1_{247}$ | $1_{248}$ | $1_{249}$ | $1_{250}$ | $1_{251}$ | $1_{252}$ | $1_{253}$ | $1_{254}$ | $1_{255}$ | $1_{256}$ | $1_{257}$ | $1_{258}$ | $1_{259}$ | $1_{260}$ | $1_{261}$ | $1_{262}$ | $1_{263}$ | $1_{264}$ | $1_{265}$ | $1_{266}$ | $1_{267}$ | $1_{268}$ | $1_{269}$ | $1_{270}$ | $1_{271}$ | $1_{272}$ | $1_{273}$ | $1_{274}$ | $1_{275}$ | $1_{276}$ | $1_{277}$ | $1_{278}$ | $1_{279}$ </ |
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$\mu$        $r$        $p$        $k = 19$  ad       $d$        $c$        $q$  ||       $h$        $s$        $t$

$\frac{1}{n} \sum_{i=1}^n x_i^2 = \frac{1}{n} \sum_{i=1}^n x_i$

4615-15-1 (1991)

4. *conspicua* Bl. = *conspicua* Bl. = *conspicua* Bl.

<sup>1</sup> *Journal of Management Education* 23(1): 10-20.

**Paperback**

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|----|---|----|---|---|---|-----|-----|-----|-------|-------|------|----------|-----|------|------|
| 41 | a | 12 | 5 | m | h | 0.6 | 0.1 | deu | $P^1$ | $\mu$ | diag | $\sigma$ | 0.0 | 19.0 | 0.71 |
|----|---|----|---|---|---|-----|-----|-----|-------|-------|------|----------|-----|------|------|

11. 45. 11. 1418 'D4' 11. 11. 1418

[illegible][illegible]

1.  $C_1$  is the set of all  $C$  such that  $C$  is a  $C$  and  $C$  is a  $C$ .

Due to the fact that the  $\alpha$ -value is not a constant, the  $\alpha$ -value is determined by the  $\alpha$ -value of the  $\alpha$ -value.

1991-1992, 1993-1994, 1995-1996, 1997-1998, 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013-2014, 2015-2016, 2017-2018, 2019-2020, 2021-2022, 2023-2024, 2025-2026, 2027-2028, 2029-2030, 2031-2032, 2033-2034, 2035-2036, 2037-2038, 2039-2040, 2041-2042, 2043-2044, 2045-2046, 2047-2048, 2049-2050, 2051-2052, 2053-2054, 2055-2056, 2057-2058, 2059-2060, 2061-2062, 2063-2064, 2065-2066, 2067-2068, 2069-2070, 2071-2072, 2073-2074, 2075-2076, 2077-2078, 2079-2080, 2081-2082, 2083-2084, 2085-2086, 2087-2088, 2089-2090, 2091-2092, 2093-2094, 2095-2096, 2097-2098, 2099-2100, 2101-2102, 2103-2104, 2105-2106, 2107-2108, 2109-2110, 2111-2112, 2113-2114, 2115-2116, 2117-2118, 2119-2120, 2121-2122, 2123-2124, 2125-2126, 2127-2128, 2129-2130, 2131-2132, 2133-2134, 2135-2136, 2137-2138, 2139-2140, 2141-2142, 2143-2144, 2145-2146, 2147-2148, 2149-2150, 2151-2152, 2153-2154, 2155-2156, 2157-2158, 2159-2160, 2161-2162, 2163-2164, 2165-2166, 2167-2168, 2169-2170, 2171-2172, 2173-2174, 2175-2176, 2177-2178, 2179-2180, 2181-2182, 2183-2184, 2185-2186, 2187-2188, 2189-2190, 2191-2192, 2193-2194, 2195-2196, 2197-2198, 2199-2200, 2201-2202, 2203-2204, 2205-2206, 2207-2208, 2209-2210, 2211-2212, 2213-2214, 2215-2216, 2217-2218, 2219-2220, 2221-2222, 2223-2224, 2225-2226, 2227-2228, 2229-2230, 2231-2232, 2233-2234, 2235-2236, 2237-2238, 2239-2240, 2241-2242, 2243-2244, 2245-2246, 2247-2248, 2249-2250, 2251-2252, 2253-2254, 2255-2256, 2257-2258, 2259-2260, 2261-2262, 2263-2264, 2265-2266, 2267-2268, 2269-2270, 2271-2272, 2273-2274, 2275-2276, 2277-2278, 2279-2280, 2281-2282, 2283-2284, 2285-2286, 2287-2288, 2289-2290, 2291-2292, 2293-2294, 2295-2296, 2297-2298, 2299-2300, 2301-2302, 2303-2304, 2305-2306, 2307-2308, 2309-2310, 2311-2312, 2313-2314, 2315-2316, 2317-2318, 2319-2320, 2321-2322, 2323-2324, 2325-2326, 2327-2328, 2329-2330, 2331-2332, 2333-2334, 2335-2336, 2337-2338, 2339-2340, 2341-2342, 2343-2344, 2345-2346, 2347-2348, 2349-2350, 2351-2352, 2353-2354, 2355-2356, 2357-2358, 2359-2360, 2361-2362, 2363-2364, 2365-2366, 2367-2368, 2369-2370, 2371-2372, 2373-2374, 2375-2376, 2377-2378, 2379-2380, 2381-2382, 2383-2384, 2385-2386, 2387-2388, 2389-2390, 2391-2392, 2393-2394, 2395-2396, 2397-2398, 2399-2400, 2401-2402, 2403-2404, 2405-2406, 2407-2408, 2409-2410, 2411-2412, 2413-2414, 2415-2416, 2417-2418, 2419-2420, 2421-2422, 2423-2424, 2425-2426, 2427-2428, 2429-2430, 2431-2432, 2433-2434, 2435-2436, 2437-2438, 2439-2440, 2441-2442, 2443-2444, 2445-2446, 2447-2448, 2449-2450, 2451-2452, 2453-2454, 2455-2456, 2457-2458, 2459-2460, 2461-2462, 2463-2464, 2465-2466, 2467-2468, 2469-2470, 2471-2472, 2473-2474, 2475-2476, 2477-2478, 2479-2480, 2481-2482, 2483-2484, 2485-2486, 2487-2488, 2489-2490, 2491-2492, 2493-2494, 2495-2496, 2497-2498, 2499-2500, 2501-2502, 2503-2504, 2505-2506, 2507-2508, 2509-2510, 2511-2512, 2513-2514, 2515-2516, 2517-2518, 2519-2520, 2521-2522, 2523-2524, 2525-2526, 2527-2528, 2529-2530, 2531-2532, 2533-2534, 2535-2536, 2537-2538, 2539-2540, 2541-2542, 2543-2544, 2545-2546, 2547-2548, 2549-2550, 2551-2552, 2553-2554, 2555-2556, 2557-2558, 2559-2560, 2561-2562, 2563-2564, 2565-2566, 2567-2568, 2569-2570, 2571-2572, 2573-2574, 2575-2576, 2577-2578, 2579-2580, 2581-2582, 2583-2584, 2585-2586, 2587-2588, 2589-2590, 2591-2592, 2593-2594, 2595-2596, 2597-2598, 2599-2600, 2601-2602, 2603-2604, 2605-2606, 2607-2608, 2609-2610, 2611-2612, 2613-2614, 2615-2616, 2617-2618, 2619-2620, 2621-2622, 2623-2624, 2625-2626, 2627-2628, 2629-2630, 2631-2632, 2633-2634, 2635-2636, 2637-2638, 2639-2640, 2641-2642, 2643-2644, 2645-2646, 2647-2648, 2649-2650, 2651-2652, 2653-2654, 2655-2656, 2657-2658, 2659-2660, 2661-2662, 2663-2664, 2665-2666, 2667-2668, 2669-2670, 2671-2672, 2673-2674, 2675-2676, 2677-2678, 2679-2680, 2681-2682, 2683-2684, 2685-2686, 2687-2688, 2689-2690, 2691-2692, 2693-2694, 2695-2696, 2697-2698, 2699-2700, 2701-2702, 2703-2704, 2705-2706, 2707-2708, 2709-2710, 2711-2712, 2713-2714, 2715-2716, 2717-2718, 2719-2720, 2721-2722, 2723-2724, 2725-2726, 2727-2728, 2729-2730, 2731-2732, 2733-2734, 27

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Full Name: \_\_\_\_\_ Date: \_\_\_\_\_

It is an important part of the process.

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1. Give the characters of Thymocytes.

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Handwritten notes at the top of the page, including the word "Biology" and some illegible text.

Q1. What are the basic elements of protein?  
 A1. Proteins are made up of amino acids. They are the building blocks of life. They are found in all living organisms.

Q2. Define circulatory system of the human body.  
 A2. The circulatory system is a network of blood vessels that transport blood throughout the body. It consists of the heart, arteries, and veins.

Q3. Write about the structure of the nephron.  
 A3. The nephron is the basic unit of the kidney. It consists of a glomerulus (a cluster of capillaries) and a renal tubule. The glomerulus filters blood, and the renal tubule reabsorbs water and electrolytes.

Q4. What are lymph nodes? What is their function?  
 A4. Lymph nodes are small, bean-shaped structures that are part of the lymphatic system. They filter out pathogens and foreign substances from the lymph. They also produce and store lymphocytes, which are white blood cells that fight infection.

Q5. Define Antigen and Antibody.  
 A5. An antigen is a substance that triggers an immune response. An antibody is a protein produced by the immune system that binds to an antigen. This binding helps to neutralize the antigen and prevent it from causing harm.

Q6. What is Passive Immunity?  
 A6. Passive immunity is a type of immunity that is acquired from another person or animal. It involves the transfer of antibodies from one individual to another. This type of immunity is temporary and does not provide long-term protection.

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**What are the major components of the ...?**

What are the major components of the ...?

**Historical Development**

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**Structure of the ...**

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**Examples**

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**Historical Development**

**Structure of the ...**

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Q.1. Define the following terms  
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 x) Microbiology  
 y) Microbiology  
 z) Microbiology

SECTION 1

- Q.2. Attempt any THREE questions
- Define the following terms  
 i) Microbiology  
 ii) Microbiology  
 iii) Microbiology
  - Describe various functions of blood
  - Describe fibrous and globular proteins
  - Write a note on connective tissue
  - Compare Gram positive and Gram negative bacteria on the basis of cell wall
  - Write down the function of adenine
  - Define virus. Write a note on the structure of virus
  - Describe the role of water in photosynthesis
  - Write a note on Metabolism
  - Describe the role of large intestine in human digestion

PAPER NO. 3

OBJECTIVE TYPE

Q.1. Multiple choice questions

|                  |    |                   |    |                      |    |
|------------------|----|-------------------|----|----------------------|----|
| 1. Biology       | 2  | Chemistry         | 3  | Physics              | 4  |
| 5. Botany        | 6  | Microbiology      | 7  | Immunology           | 8  |
| 9. Zoology       | 10 | Genetics          | 11 | Cell Biology         | 12 |
| 13. Biochemistry | 14 | Physiology        | 15 | Pathology            | 16 |
| 17. Pharmacology | 18 | Forensic Medicine | 19 | Environmental Health | 20 |

## SUBJECTIVE TYPE

Section 1

Q.1. Write a paragraph on the following.

1. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.2. Write a paragraph on the following.

2. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.3. Write a paragraph on the following.

3. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.4. Write a paragraph on the following.

4. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.5. Write a paragraph on the following.

5. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.6. Write a paragraph on the following.

6. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

Q.7. Write a paragraph on the following.

7. The importance of water.

Ans. Water is the most essential element for life. It is the source of life and without it, life would not exist. It is also a very important part of our environment.

**Q.1** Standard

Q.1. What is a cell?

Ans. The smallest unit of life.

Q.2. Define cell theory.

Ans. The cell is the basic unit of life.

Q.3. Examples

Q.4. What is a cell?

Ans. The smallest unit of life.

Q.5. What is a morphological study of a cell?

Ans. The study of the shape and structure of a cell.

Q.6. What do you know about plant cells?

Ans. Plant cells are eukaryotic.

**Q.7** Short answer questions

Q.1. Define osmosis with an example.

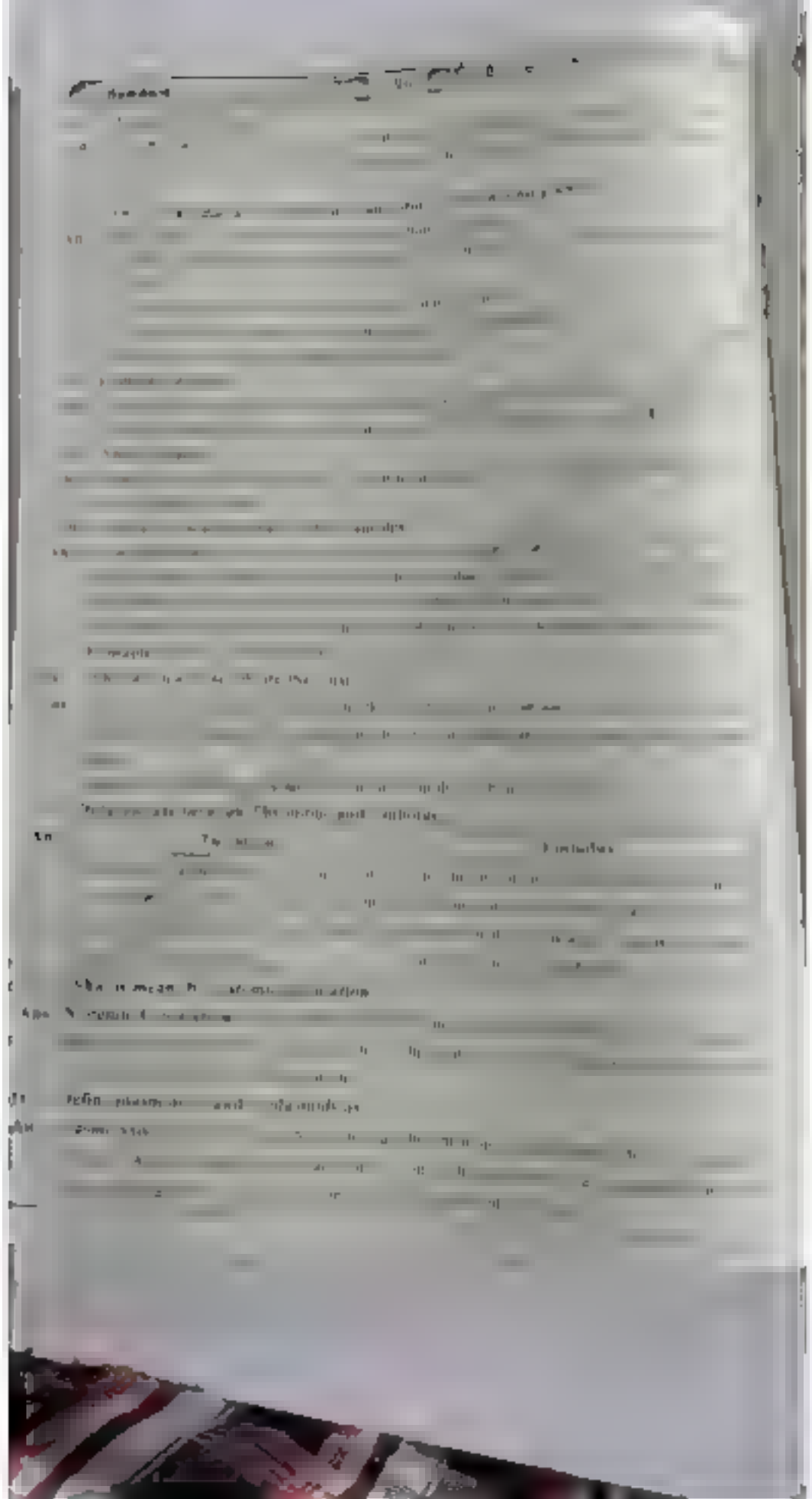
Ans. The movement of water from a region of high water potential to a region of low water potential.

Q.2. What is Hydroponic culture technique?

Ans. The technique of growing plants without soil.

Q.3. How intermediate filaments support cell?

Ans. They provide mechanical strength to the cell.



**Explanatory:** If plantaried cell is placed in distilled water (which has higher water potential) the water potential would move from distilled water through diffusion membrane cell membrane into the cell, and the cell would become turgid cell.

#### 9.4 Short answer questions

Write a short note on AIDS.

**Ans:** AIDS is acronym for Acquired Immune Deficiency Syndrome. It is caused by the human immunodeficiency virus (HIV).

**Symptoms:** The symptoms of AIDS include are very serious illness, sudden weight loss, swollen lymph nodes and general loss of immune function.

**Prevention:**

1. Avoid the direct contact with HIV
2. Prevent infectious drugs with common syringe.
3. Give sterile needles/syringes and needles.

**Q10) What are viroids and viroids?**

**Ans:** **Viroids and Viroids:** Viroids and viroids virus belong to the same category. They are large enveloped RNA viruses. Viroids is highly contagious virus spread by potato leaf. About 80% of adults are immune to it. Viroids is one of the commonest diseases of the childhood and human population. This disease develops usually in its virus.

**Q11) What is virus and capsid?**

**Ans:** The complete, mature and infectious particle is called as virus. The virus are composed of a central core of nucleic acid, either DNA or RNA. Which is known as the genome and is surrounded by a protein coat, the capsid. Capsid give a definite shape to virus. Capsid is made up of protein subunits known as capsomeres. The number of a capsomere is a characteristic of a virus.

**Q12) What are plasmids and what is their role in genetic engineering?**

**Ans:** Many bacteria have plasmids in addition to main chromosomes. They are the circular, double stranded DNA molecules. They are self replicating, and are not essential for bacterial growth and metabolism. They often contain drug resistant, fertility factors, toxins and insect resistance genes or more. Plasmids can be extracted and used as vectors to carry foreign gene into the host bacteria during genetic engineering processes.

**Q13) Describe the three kinds of cells present in gastric glands.**

**Ans:** **Composition of Gastric Glands:**

1. Mucous cells secrete.
2. Parietal or oxyntic cells secrete hydrochloric acid.
3. G cells secrete gastrin.

**Composition of Gastric Juice:** Gastric juice is the secretion of these kinds of cells of gastric glands. Gastric juice contains mucus, HCL, and pepsinogen.

**Q14) Write the composition of pancreatic juice.**

**Ans:** The exocrine tissues of pancreas secrete a juice called pancreatic juice. The pancreatic juice has many enzymes. These enzymes digest the different components of food like carbohydrates, fats and proteins. These enzymes are:

1. Amylase: It is also called amylase. It digests starch into maltose.
2. Lipase: It is a fat digesting enzyme. It hydrolyses fat into fatty acids and glycerol.

1. Trypsin is a secreted digestive enzyme called **trypsinogen**. Trypsinogen protein can be activated and converted to trypsin.

Q10. How haemoglobin differ from myoglobin?

Ans. Functions of Myoglobin:

| Myoglobin   | Hemoglobin   |
|---|--|
| 1. Myoglobin consists of just one polypeptide chain associated with an iron containing ring structure which can bind with one molecule of oxygen. | 1. Hemoglobin consists of four polypeptide chain associated with an iron containing ring structure which can bind with four molecules of oxygen. |
| 2. The affinity of myoglobin to combine with oxygen is much higher as compared to hemoglobin.   | 2. Hemoglobin is more increases the oxygen carrying capacity of the blood about 75 times.  |

Q11. How pH and temperature affect capacity of haemoglobin to combine with oxygen?

Ans. Effect of pH on Capacity of Haemoglobin to Combine with Oxygen: The pH of blood influences the degree to which oxygen binds to haemoglobin. As the pH of the blood declines, the amount of oxygen bound to haemoglobin also declines.

Conversely an increase in blood pH results in an increased ability of haemoglobin to bind oxygen.

Effect of Temperature on Capacity of Haemoglobin to Combine with Oxygen:

Rise in temperature also causes a decrease in the oxygen carrying capacity of blood, e.g., in the warmest muscular activity.

Q12. How much Carbon Dioxide is present in venous and arterial blood?

Ans. CO<sub>2</sub> percentage in Arterial Blood: Arterial blood contains about 5ml of CO<sub>2</sub> per 100 ml of arterial and venous blood.

CO<sub>2</sub> percentage in Venous Blood: Venous blood contains about 54ml of CO<sub>2</sub> per 100 ml of blood.

### (SECTION - II)

Q13. Attempt any THREE questions.

- Differentiate between deductive and inductive reasoning with examples.
- Define opportunity. Give its types.
- Describe primary and secondary structure of protein.
- Give an account of Anomycetes.
- Write a note on use and misuse of antibiotic.
- Describe the life cycle of an angiospermic plant.
- Sketch the infection cycle of HIV.
- Draw glycolysis. Give its energy balance.
- Describe the structure and function of plasma membrane.
- Discuss Heterotrophic Nutrition methods in plants.

# ANSWER SHEET

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UP-TO-DATE

HAMDARD

# SMART PAPERS

## Informative Note

Knowledge is power and **HAMDARD KUTAB KHANA** is always working for the spread of knowledge. We have close co-operation with Education Department. It has always been an honour of **HAMDARD KUTAB KHANA** that it gives its readers awareness about the latest updates of Education Department. It also prepares the helping reading material according to the curriculum.

Unfortunately, the process of education is interrupted this year just because of the Pandemic (Covid-19). After viewing the current circumstances Education Department has introduced the **Smart Syllabus** for all the classes according to the **Accelerated Learning Programme (ALP)** this year so that the students would be able to complete the next annual examination 2021.

Now **HAMDARD KUTAB KHANA** has published the Up-to-Date papers according to the **Smart Syllabus** consisting of Chapterwise Board Questions and model papers for the convenience of the students.

Hopefully, these papers will be beneficial for the students of Intermediate to prepare the next annual examination and get success in the board papers.

It is hoped that our this effort of providing you complete help and guidance will be admired by all of you and this effort shall also receive the same prominent place in the hearts of the learned teachers and the students.

Thanks

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